ORIGINAL

E000009352

BEFORE THE ARIZONA CORPORATION COMMISSION

Robert "Bob" Burns, Chairman
Boyd Dunn
Sandra D. Kennedy
Justin Olson
Lea Marquez Peterson

IN THE MATTER OF THE APPLICATION OF ARIZONA PUBLIC SERVICE COMPANY FOR A HEARING TO DETERMINE THE FAIR VALUE OF UTILITY PROPERTY OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN	)	Docket No. E-01345A-19-0236

FEDERAL EXECUTIVE AGENCIES' NOTICE OF FILING DIRECT TESTIMONY OF MICHEAL P. GORMAN AND CHRISTOPHER C. WALTERS

Pursuant to the Procedural Order issued by the Arizona Corporation Commission on July 31, 2020, the Federal Executive Agencies hereby file the Direct Testimony (issues other than rate design) of Michael P. Gorman and Christopher C. Walters in the above-captioned case.

RESPECTFULLY SUBMITTED THIS 2nd day of October, 2020.

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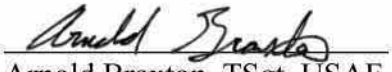
I hereby certify that FEA's Direct Testimony of Michael P. Gorman and Christopher C. Walters was e-filed through the ACC Portal this 2nd day of October, 2020 and the original and 8 copies mailed to:

Docket Control
Arizona Corporation Commission
1200 W. Washington St.
Phoenix, AZ 85007

Copies of the foregoing were delivered this 2nd day of October, 2020 to each party on the attached service list by electronic or regular mail.



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BEFORE THE

ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF ARIZONA PUBLIC SERVICE COMPANY FOR A HEARING TO DETERMINE THE FAIR VALUE OF THE UTILITY PROPERTY OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN	**DOCKET NO. E-01345A-19-0236**

Direct Testimony and Attachments of

Michael P. Gorman

On behalf of

Federal Executive Agencies

October 2, 2020

BRUBAKER & ASSOCIATES, INC.

Project 10899

BEFORE THE

ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF ARIZONA PUBLIC SERVICE COMPANY FOR A HEARING TO DETERMINE THE FAIR VALUE OF THE UTILITY PROPERTY OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN	**DOCKET NO. E-01345A-19-0236**

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BEFORE THE

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Direct Testimony of Michael P. Gorman

I. INTRODUCTION

Q PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A Michael P. Gorman. My business address is 16690 Swingley Ridge Road, Suite 140, Chesterfield, MO 63017.

Q WHAT IS YOUR OCCUPATION?

A I am a consultant in the field of public utility regulation and a Managing Principal of Brubaker & Associates, Inc., energy, economic and regulatory consultants.

Q PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND EXPERIENCE.

A This information is included in Appendix A to this testimony.

Q ON WHOSE BEHALF ARE YOU APPEARING IN THIS PROCEEDING?

A I am testifying on behalf of the Federal Executive Agencies ("FEA"), consisting of certain agencies of the United States government, which have offices, facilities, and/or installations in the service area of Arizona Public Service Company ("APS" or "Company"), from whom they purchase electricity and energy services.

Q WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A I will summarize adjustments to APS's claimed revenue deficiency, and support adjustments related to several major components of the Company's cost of service.

My silence with respect to any position taken by APS in its application or direct testimony in this proceeding should not be interpreted as an endorsement of that position.

II. SUMMARY

Q PLEASE SUMMARIZE YOUR RECOMMENDATIONS AND CONCLUSIONS.

A As discussed later in this testimony, I recommend several adjustments to APS's claimed revenue deficiency of $184 million (5.6%).[1] As shown in Table 1 below, based on these adjustments, and potentially others sponsored by other parties, I find APS's claimed revenue deficiency of $184 million is overstated by at least $128.3 million.

[1]Guldner Direct at 6. The claimed revenue deficiency without the Four Corners Selective Catalytic Reduction project is $111 million, or 3.4%.

TABLE 1

Revenue Requirement Issues
($ Millions)

Description	Amount
Claimed Rev. Deficiency	$184.0
Percent	5.60%
Adjustments:	
Return on Equity	$55.4
Fair Value Increment	$14.9
Ocotillo Modernization	$15.6
Pension Asset	$42.4
Total Adjustments	$128.3
Adjusted Rev. Deficiency	$55.7

The return on equity adjustment in Table 1 is supported by my colleague, Mr. Christopher C. Walters. Mr. Walters takes issue with the Company's recommended return on equity on original cost rate base, and the development of a fair value increment. The combination of his proposal to adjust the return on equity to a more reasonable market-based amount, and correct the fair value increment consistent with precedent in Arizona, lowers the Company's claimed revenue deficiency by $70.3 million, as outlined in Table 1 above.

In my testimony, I address the Ocotillo Modernization Project ("OMP") deferral and the inclusion of a pension asset in rate base.

Q PLEASE DESCRIBE YOUR ADJUSTMENT TO THE COMPANY'S PROPOSAL TO RECOVER DEFERRED COSTS FROM THE OMP?

A For the reasons outlined below, the OMP deferral represents costs deferred after the new plant was placed in-service up to the proposed ratemaking date in this proceeding. The Arizona Corporation Commission ("ACC" or Commission") approved APS deferring these post-in-service to ratemaking dates in a settlement in Docket No. E-01345A-16-0123, Decision No. 76295. However, the Commission did not find that these costs would actually be included in the development of rates. APS has failed to justify including these deferred costs in prospective rates.

A review of rate revenue during the period the deferrals occurred suggests that APS revenue collections may have been more than adequate to support expensing these deferrals during the deferral period. As such, rate revenue contributed to APS from customers during the deferral period has been adequate to fairly compensate the Company for its full cost of service, including the post-in-service costs associated with the OMP. For this reason, I recommend removing this cost from the Company's claimed revenue deficiency. This reduces APS's claimed revenue deficiency by $15.6 million.[2]

In the alternative, if the Commission provides some level of OMP deferral included in cost of service, I recommend those costs be recovered on a levelized basis, and the carrying charge be set at the Company's embedded cost of debt. Under this alternative position, it would be appropriate to adjust the Company's claimed revenue deficiency by $4.4 million.[3] This adjustment is the difference between using the Company's proposed declining balance recovery with a levelized

[2]Attachment MPG-1DR, page 1, Column 6, line 2.
[3]Attachment MPG-1DR, page 1, Column 6, line 2 less Attachment MPG-1DR, page 2, Column 6, line 2.

recovery, amortized over a ten-year period, and using a debt cost carrying rate rather than the Company's weighted average cost of capital.

Q PLEASE DESCRIBE YOUR RECOMMENDATION REGARDING THE COMPANY'S PENSION ASSET.

A I recommend excluding the pension asset the Company proposes to include in rate base. APS proposes to include a pension regulatory asset of $712.9 million in its rate base. This pension asset increases its claimed revenue deficiency by $42.4 million. For the reasons outlined below, however, the Company has not demonstrated this regulatory pension asset is appropriate to include in cost of service.

The existence of APS's pension asset was created as a regulatory accounting adjustment that eliminated the recording of Other Comprehensive Income ("OCI"), which is an adjustment to APS's common equity balance. Recording a pension regulatory asset increased the Company's common equity balance, increased its equity ratio, and also produced the pension asset.

The creation of this pension regulatory asset therefore increased the Company's overall rate of return applied to the Company's full original cost rate base and fair value rate base.

Q IS INCLUDING THE PENSION REGULATORY ASSET IN APS'S COST OF SERVICE REASONABLE?

A No. Including the pension regulatory asset in rate base is not appropriate. This regulatory asset is a "paper" asset that does not represent an investment by APS that was funded by investor capital. Indeed, APS acknowledged that the creation of this regulatory asset had no impact on its cash position and did not represent a cost to

APS when it was created on December 31, 2006.[4] Because this asset does not reflect a capital cost or an operating cost to APS, but rather was simply an accounting mechanism in order to avoid recording an OCI adjustment to its common equity, there is no capital cost associated with this asset. Therefore, including it in rate base would allow it to recover a cost from customers that it is not actually incurring.

Further, the Company's proposal to use regulatory accounting to create a pension regulatory asset in an effort to offset OCI reduction to common equity capital balances, already results in an increase to its rate of return and revenue requirement. The inclusion of a pension regulatory asset in addition to this revenue requirement is not reasonable. Finally, APS has not shown that the creation of a pension regulatory asset creates any benefit to customers. For these reasons, the Company's proposed regulatory pension asset account should be removed from its cost of service.

Removing this pension regulatory asset cost from its cost of service reduces APS's claimed revenue deficiency by $42.4 million.[5]

III. OCOTILLO DEFERRAL

Q WHAT IS THE OCOTILLO MODERNIZATION PROJECT ("OMP")?

A APS retired two approximately 60-year-old gas steam turbines (220 MW) and replaced them with five combustion turbines (510 MW) at the Company's Ocotillo Power Plant. APS witness Brad J. Albert discusses the details of OMP and the Company's decision to pursue the project while APS witness Elizabeth A. Blankenship discusses the accounting treatment of certain deferred OMP costs.

[4]Response to FEA 5.6a, included in Attachment MPG-2DR, page 4.

[5]($712.908 million prepaid pension asset - $176.445 million deferred taxes) * 91.80% allocation factor * 8.61% pre-tax ROR on original cost rate base supported by Mr. Walters = $42.4 million.

Mr. Albert states the OMP was necessary because the old steam units had become difficult to repair and maintain, the project offered a unique opportunity to add capacity within the Phoenix area, and the project was necessary to support the integration of increased levels of renewable energy. Mr. Albert states the additional generation capacity provided by OMP was needed due to customer load growth and expiring purchase power agreement. He states there was over 2,000 MW of expiring purchase power contracts and there were no uncommitted existing units in the region that could provide the flexibility APS wanted given the increases in solar generation.

Q PLEASE DESCRIBE THE DEFERRED OMP COSTS.

A The 2017 Settlement Agreement in Docket No. E-01345A-16-0123 gave APS approval to defer certain costs related to OMP for consideration in this rate case. The 2017 Settlement Agreement reads in part as follows:

> **X. COST DEFERRAL RELATED TO THE OCOTILLO MODERNIZATION PROJECT**
>
> **10.1 -** APS will be authorized to defer for possible later recovery through rates, all non-fuel costs (as defined herein to include all O&M, property taxes, depreciation, and a return at APS's embedded cost of debt in this proceeding) of owning, operating, and maintaining the Ocotillo Modernization Project ("OMP") and retiring the existing steam generation at Ocotillo. Nothing in this paragraph shall be construed in any way to limit the Commission's authority to review the entirety of the project and to make any disallowances thereof due to imprudence, errors or inappropriate application of the requirements of this Decision. The interest component of the Ocotillo deferral will be set at APS's embedded cost of debt established in this Agreement.
>
> **10.2 -** The entire OMP will be in service before the rate effective date of APS's next general rate case, and the entire OMP investment will be addressed and resolved in that proceeding.
>
> **10.3 -** This agreement does not address the prudence of the OMP, and a deferral of the OMP costs does not guarantee recovery of those costs. Consideration of OMP in APS's next general rate case does not

> create any precedent, guarantee, or certainty regarding the consideration or treatment of post-test year plant.[6]

OMP was placed in-service on May 30, 2019. The post-in-service deferral for the OMP as of December 31, 2020 is approximately $94.9 million, including $9.5 million before June 30, 2019 and $85.4 million from July 1, 2019 through December 31, 2020. Table 2 provides the components of the deferred costs.

TABLE 2

Ocotillo Deferral Reg. Asset
($ Millions)
(December 31, 2020)

Description	Deferred Costs
Debt Return	$46.4
Property Taxes	$10.6
Depreciation	$32.9
O&M Costs	$5.0
Total	$94.9

Sources:
Staff 5.7 – APS 19RC01644_RB, Attachment MPG-2DR, pages 17-18.
Staff 5.7 – APS 19RC01641_IS, Attachment MPG-2DR, pages 15-16.

Q PLEASE DESCRIBE APS'S REQUEST REGARDING THE DEFERRED COSTS.

A APS is seeking to recover and include in rates the non-fuel costs associated with OMP that were deferred in the 2017 Settlement Agreement, as detailed in Table 2 above. Ms. Blankenship sponsors two adjustments related to OMP. First, the test

[6]Docket No. E-01345A-16-0036, Decision No. 76295, Exhibit A at 13 (emphasis added).

year rate base is adjusted to include the deferred OMP costs from July 1, 2019 through December 31, 2020. This increases ACC jurisdictional average rate base by $64.3 million – an average test year regulatory asset balance of $85.4 million and related accumulated deferred income tax balance of $23.5 million.[7] Second, APS proposes to amortize the end of year OMP regulatory asset balance of $94.9 million over ten years.[8] This produces an annual amortization expense of $9.49 million.

Q HAS APS MET ITS OBLIGATION UNDER THE TERMS OF THE 2017 SETTLEMENT AGREEMENT IN DOCKET NO. E-01345A-16-0123?

A No. As outlined above, and as referenced in the Direct Testimony of APS witness Elizabeth Blankenship at pages 34 and 35, the Commission authorized APS to defer these costs "for possible later recovery through rates, all non-fuel costs" including operation and maintenance ("O&M"), property taxes, depreciation, and a return at APS's embedded cost of debt.

APS witness Blankenship has not provided evidence that it is just and reasonable to allow the Company to include this deferral balance in future costs of service. Specifically, the deferred costs reflect costs incurred by APS over the period July 1, 2019 through the end of this year, 2020. APS has not provided evidence that the rates in effect during this deferral period did not produce sufficient revenue to allow APS to fully recover these post-in-service costs under existing rates, even if these were not explicitly included in the development of its cost of service.

While the cost may not have been included in the development of existing rates, that does not mean the revenue collected during the historical period from customers under existing rates was not sufficient to compensate APS for its full cost

[7]APS includes the adjustment as Attachment EAB-26DR.
[8]APS includes the adjustment as Attachment EAB-27DR. A corrected Attachment EAB-27DR was provided in response to Data Request Staff 5.7, included in Attachment MPG-2DR, pages 15-16.

of service, including the OMP deferred costs. It is not be appropriate to allow APS to defer the costs for the OMP incurred currently, and build them into future rates, if the revenue they collected from customers in the year the cost was incurred had been sufficient to allow APS to fully recover these OMP costs.

Q IS THERE EVIDENCE THAT THE RATE REVENUE DURING THE DEFERRAL PERIOD WAS ADEQUATE TO PROVIDE APS RECOVERY OF ALL OR PART OF THESE OMP DEFERRED COSTS?

A Yes. Indeed, there are several aspects of the Company's filing that show that rates in effect were already providing the Company sufficient revenues to earn a fair rate of return during the deferral period, and compensated the Company for these deferred costs. Specifically, I refer to the following:

1. Over the 12-month period ending June 30, 2019, the Company's Schedule A, shows the Company's current rates were providing the Company a return of 7.22%. This rate of return is in excess of the fair rate of return by my associate Christopher C. Walters of 6.89%.

2. During the deferral period that went from July 1, 2019 through year-end 2020, there is significant increased revenue associated with adding new customers to the system. For example, on the Company's Schedule C-2, page 4, it shows that revenues would increase by $12.9 million by annualizing customers during the 12-month period ending June 30, 2019. If there were additional customer growth between this date and the end of 2020, the amount of additional revenue produced by customer growth would have contributed to new costs during the deferral period.

3. There would have been depreciation expense associated with the retired Ocotillo coal-fired unit that would have been included in the Company's rates up until new base rates are approved by the Commission. This cost recovery will continue to be recovered by APS up until rates are changed after December 31, 2020. Ms. Blankenship, however, did not reflect any avoided fixed O&M and depreciation expense offsets against the post in-service deferred costs.

The combination of the Company's current rates in effect providing stronger than normal earnings, increased revenue associated with customer sales growth, and

operating expense and depreciation expense savings associated with retirement of the coal-fired Ocotillo facility that was replaced by the new OMP gas facility, all suggest that the Company's rates may have been more than adequate to provide recovery, in full or part, of the post-in-service depreciation and O&M costs on the OMP new gas facility from July 1, 2019 through year-end 2020. For these reasons, APS has not proven that it would be reasonable to include these post-in-service deferred expenses in a regulatory asset in setting prospective rates.

Q IF THE COMMISSION DOES INCLUDE THE DEFERRAL COSTS IN PROSPECTIVE RATES, SHOULD IT DO IT IN THE MANNER REQUESTED BY THE COMPANY?

A No. Given the uncertainty about whether or not the revenue during the deferral period was more than adequate to provide full recovery of these deferred costs, the Commission should at a minimum mitigate to the greatest extent possible, these deferred costs in setting rates in this case. This is critical in protecting customers. From this standpoint, as an alternative to my primary recommendation to exclude these from APS cost of service, I am recommending two adjustments to the Company's proposed treatment:

1. First, I am recommending them to be carried at a cost of debt rather than the weighted average cost of capital. This reduced cost illustrates that it is not clear whether or not the deferral is necessary based on a review of earnings during the deferral period.

2. Second, I am reflecting a levelized ten-year cost recovery as opposed to a declining balance cost recovery as recommended by the Company. This levelized cost recovery reflects this as a non-recurring asset as soon as it is paid off and will not be renewed.

3. Third, a levelized cost will mitigate the increase in this case but still provides the Company full recovery of these deferred costs over the amortization period.

Q WHAT IS THE IMPACT ON THE COMPANY'S REVENUE REQUIREMENT UNDER YOUR PROPOSED ALTERNATIVE REVENUE REQUIREMENT TREATMENT OF THE OMP DEFERRAL COSTS?

A Under the Company's proposal, the OMP deferral will increase rate base by $61.7 million (Schedule B-2, page 4) and increase amortization expense by $9.49 million. Using the proposed rate of return adjusted for income tax of my colleague, Christopher C. Walters, this proposed treatment would result in an annual revenue requirement of approximately $15.6 million in the test year, as shown on Attachment MPG-1DR, page 1.

Under a levelized cost recovery, using the cost of debt as the carrying charge, the annual revenue requirement for a ten-year amortization of these costs would be approximately $11.2 million over ten years. As such, my adjustment would reduce the claimed revenue requirement by approximately $4.4 million. This is developed by taking the difference between the test year revenue requirements calculated on Attachment MPG-1DR, page 1, Column 6, line 2 (APS proposed), and Attachment MPG-1DR, page 2, Column 4, line 2 (Gorman rate at cost of debt).

IV. PENSION ASSET

Q PLEASE DESCRIBE APS'S PENSION ASSET.

A APS includes a $712.9 million[9] pension asset as part of the $1,421 million regulatory assets line of the Total Company adjusted original cost rate base shown on Schedule B-1.[10] The pension asset represents the unamortized portion of the actuarial losses

[9] This amount is offset by $176.445 million in deferred taxes. Workpaper EAB-WP5DR, Schedule B-1, Net Regulatory Assets/Liabilities.

[10] APS response to Data Request FEA 1.26, included in Attachment MPG-2DR, page 3.

of the APS pension plan. APS stated in response to Data Request AECC 10.1a (included in Attachment MPG-2DR, page 6) that:

> The pension plan is under-funded and reported as a liability. FAS 71 accounting allows the regulated utility (APS) to establish a regulatory asset/liability to record the offset to the funded status adjustments instead of an offset to Other Comprehensive Income/Loss.

The Company's net unamortized loss for the APS pension plan was $733.4 million at the end of 2018, $712.9 million at the end of the test year, and $660.2 million at the end of 2019.[11] The ACC jurisdictional allocation of the test year pension asset is $654.4 million.[12]

Q IS THERE COMMISSION PRECEDENT REGARDING APS'S DECISION TO INCLUDE THE UNAMORTIZED LOSSES AS A PENSION ASSET IN RATE BASE?

A No. APS was asked to cite all Commission precedent that allows the Company to include the pension asset as a regulatory asset in rate base. The Company cited Decision Nos. 69663, 71448, 73183 and 76295.[13] Three of the Decisions cite to Orders that approved a settlement, which typically state the settlement should not be relied upon as precedent.[14] Regardless, none of the three Orders addresses and approves APS's proposed treatment of its pension asset.

Decision No. 69663, June 28, 2007, discusses the Company's pension asset but does not address including the pension asset in rate base. In that decision, the

[11]APS response to Data Request AECC 10.5, included in Attachment MPG-2DR, page 9.

[12]$712.9 million * 91.8%. The allocation factor was provided in response to Data Request AECC 13.4, included in Attachment MPG-2DR, page 10.

[13]APS response to Data Request AECC 10.1, included in Attachment MPG-2DR, page 7.

[14]Section 40.3 of Exhibit A to Decision No. 76295 states, "Neither this Agreement nor any of the positions taken in this Agreement by any of the Signing Parties may be referred to, cited, or relied upon as precedent in any proceeding before the Commission, any other regulatory agency, or any court for any purpose except to secure approval of this Agreement and enforce its terms."

Commission rejected APS's proposed five-year amortization of the underfunded projected benefit obligation.[15]

APS acknowledged in a data response that its decision to include the unamortized losses as a pension asset in rate base has not been addressed by the Commission (attached as Attachment MPG-2DR, page 11). This response reads in part as follows:

> Although not explicitly addressed in each of the Decisions mentioned in the Company's response to AECC 10.1(b), the pension asset is an investment in APS's employees and therefore treated in rate base in the same manner as other investments, such as a distribution substation or generating plant.
>
> As part of a rate case, Staff and intervenors review the Company's revenue and expense as set forth in its Standard Filing Requirements through the discovery process and propose adjustments for the Commission's consideration based on their individual reviews. The fact that there is no discussion in these decisions regarding a pension asset or liability shows that this treatment of pension expense is accepted ratemaking practice.[16]

Q IS IT APPROPRIATE TO INCLUDE THE COMPANY'S PENSION REGULATORY ASSET IN ITS COST OF SERVICE?

A No. This pension asset is not appropriate for including in cost of service for several reasons. First, the pension regulatory asset is not the result of costs incurred by the Company, or use of investor funding to make capital investments. As such, the Company is simply not incurring a carrying charge on this asset. Rather, this pension regulatory asset is simply the result of accounting mechanisms undertaken by the Company in order to avoid a recording and OCI adjustment to its common equity capital. Under Generally Accepted Accounting Principles ("GAAP"), the Company states that the funding status adjustment for its pension account is generally recorded

[15]Docket No. E-01345A-05-0816/0826/0827, Decision No. 69663, page 26.
[16]APS response to Data Request AECC 13.7, included in Attachment MPG-2DR, page 11.

as an OCI adjustment to common equity. However, for regulated companies, regulatory accounting rules allow the utility to establish a regulatory asset/liability to record the pension funding status adjustment rather than record an OCI adjustment to common equity capital.

Q DOES RECORDING THE PENSION ASSET AND AVOIDING CREATING AN OCI ADJUSTMENT TO COMMON EQUITY IMPACT APS'S COST OF SERVICE IN THIS PROCEEDING?

A Yes. It increases its overall rate of return, and revenue requirement. By creating a regulatory asset and avoiding recording the funding status of the fund in the OCI, the Company is able to increase its common equity balance, which increases its common equity ratio and increases its overall rate of return, and related income tax expense. As shown on my Attachment MPG-3DR, using the Company's proposed rate of return and the Pension OCI adjustment shown on Schedule D-1, page 1, this adjustment to the common equity balance, increases the Company's revenue requirement by $1.2 million when applied to the Company's original cost rate base because it increases the common equity ratio of total capital, and thus increases the overall rate of return and related income tax expense. So this chosen accounting method has a clear benefit to the Company by increasing its cost of service.

Q PLEASE EXPLAIN WHY THE REGULATORY ASSET CREATED TO AVOID RECORDING AN OCI ADJUSTMENT TO COMMON EQUITY IS NOT APPROPRIATE TO INCLUDE IN THE UTILITY'S RATE BASE.

A The regulatory asset is not appropriate for including in rate base, because it does not represent a cost or an investment by the Company that is funded by investor capital.

As such, there is no carrying charge on the asset. Rather, the asset will simply be amortized as the underfunding status of the fund is reduced over time as the Company collects pension expense in its annual cost of service, and the Company makes necessary cash contributions to its pension trust. Because the regulatory asset does not represent an asset that was funded by investor capital, it is not appropriate to allow the Company to recover a carrying charge from customers, because the utility simply does not incur this cost.

Q HOW DOES APS RECOVER ITS PENSION COSTS FROM CUSTOMERS IN SETTING ITS COST OF SERVICE?

A APS has included in its cost of service its annual pension expense. The Company's development of an annual pension expense already includes a component for amortization of actuarial gains and losses. This is acknowledged by the Company in response to Data Request AECC 10.4 (attached as Attachment MPG-2DR, page 8). By including the FASB net periodic pension costs in cost of service in this case, the Company is already recovering from customers in its pension expense the amortization of actuarial gains and losses occurring within its pension trust fund. The Company's proposal to also include a regulatory asset double-counts this cost, and is therefore inappropriate.

For all these reasons, the Company's proposal to include in its cost of service a prepaid pension asset, which is based on actuarial losses occurring within its pension trust, is not just and reasonable. Removing this from its cost of service will lower its claimed revenue deficiency by $42.2 million.[17]

[17]($712.908 million prepaid pension asset - $176.445 million deferred taxes) * 91.80% allocation factor * 8.61% pre-tax ROR on original cost rate base supported by Mr. Walters = $42.4 million.

Q IS REMOVING THE REGULATORY PENSION ASSET, AS YOU HAVE OUTLINED ABOVE, DIFFERENT THAN ADJUSTMENTS FOR THE UTILITY'S PLANT IN-SERVICE?

A No. The pension regulatory asset is being removed because it is not an asset that was funded by investor capital. Indeed, as outlined above, it is a paper asset that was not a funded asset by any stakeholder at all. With respect to plant in-service, a utility is not allowed to include in its original cost rate base plant in-service investments that are contributed by customers. Specifically, the Company's Schedule B-1 outlines an adjustment to plant in-service for plant investments that were paid for by contributions from customers, "Customer Advances." That is, customers paid the utility upfront for certain plant investments to connect them to the utility's system. These customer advances are payments received by APS for plant funded by customers. These customer-funded plant investments are removed from the utility's rate base, and removed from the utility's depreciation expense in measuring its cost of service. The cost of service reflects investments that are funded by investor capital, and used to measure the utility's rate base investments to which the customers are obligated to pay the utility's cost of capital. Plant investments or any asset that is funded by contributions from customers, or any other capital source other than utility investors, should not be included in the utility's cost of service. For these reasons, removing the regulatory pension asset from cost of service is consistent with plant in-service ratemaking treatment, and is just and reasonable.

V. FORMULA RATE

Q IS APS REQUESTING THE COMMISSION TO CONSIDER A FORMULA RATE METHODOLOGY FOR CHANGING ITS COSTS IN THIS PROCEEDING?

A The Company has provided an overview of what it claims to be the merits of a formula rate process. The Company calls it an alternative, and is not explicitly requesting a formula rate be implemented in this proceeding.

Company witness Leland Snook outlines what he believes to be the merits of a formula rate alternative to the Company's current base rates and adjustor mechanisms at page 20 of his direct testimony. Mr. Snook's testimony outlines his claimed benefit of the Company's current adjustor mechanisms used to recover specific portions of the Company's costs. Mr. Snook maintains these adjustor mechanisms reduce the frequency of rate cases, introduce rate gradualism through more frequent and smaller adjustments to rates, and provide support for renewable energy and energy efficiency programs.

He goes on to state that a formula rate mechanism will allow for incremental annual adjustments to rates based on agreed upon Commission-approved inputs to a formula that are established during a rate case.[18] He states with the agreed upon structure in place the inputs are updated and reviewed annually and rates are adjusted accordingly. He notes as the merits of the formula rate that the Company's earnings would receive an immediate avenue for the Commission to adjust rates, allow for the elimination of a number of adjustor mechanisms which could be replaced by formula rate adjustments, and he maintains that a formula rate would create additional rate gradualism, decrease regulatory lag, and extend time periods between rate cases rather than continuation with the current adjustor mechanisms.

[18] *Id.* at 22.

Mr. Snook also maintains that the formula rate process has been used by the Federal Energy Regulatory Commission ("FERC"), and believes it passes on significant incentives and benefits to customers. He also proposes that a formula rate process could be placed in effect in conjunction with certain service reliability and customer satisfaction metrics. He opines that for reliability, a formula rate process could also include filings on System Average Interruption Frequency Index ("SAIFI") and could include an internal customer satisfaction metric.

Q SHOULD THE COMMISSION APPROVE THE COMPANY'S FORMULA RATE PROCESS AS OUTLINED BY THE COMPANY?

A No. The formula rate process has many restrictions on protecting customers from paying rates that are not just and reasonable. Indeed, while base rate filings may be needed more often than they would be under a formula rate process, base rate cases provide significant customer protection and a voice in setting prices. Alternatively, a formula rate process severely restricts customers' ability to make recommendations to the regulatory Commission, and the regulatory Commission to weigh changes in cost of service, and judge whether or not changes in rates are necessary and reasonable.

Q PLEASE SUMMARIZE WHY YOU BELIEVE THAT A FORMULA RATE PROCESS AS OPPOSED TO TRADITIONAL BASE RATE RECOVERY ERODES CUSTOMERS' PROTECTION.

A Adjusting rates based on a formula methodology, as opposed to traditional ratemaking, erodes customers' protections in at least the following ways:

1. Rate-setting is a conduit for passing through changes in costs to customers via formula rate changes. As such, the Company no longer

would be required to justify the reasonableness and prudence of changes in cost of service before cost increases are used to justify rate increases.

2. Further, because there is little scrutiny of changes in cost, and the Company has an incentive to grow its rate base via capital investments, the Company has an economic incentive to grow rate base faster than it would under traditional ratemaking. Increases in capital investments will be included in the formula rate, earnings will increase along with increases in rate base, and prices will be increased to customers. However, in a formula rate process, there is no assessment of whether or not the utility's capital investments are prudent and reasonable, or whether or not the timing of the capital program provides adequate benefits to customers to justify the increase in rates.

3. The utility would be conflicted in growing its rate base to increase its profit and dividend-paying ability versus making capital investments in a timely manner which balances increases in cost of service with the benefits of maintaining or improving service reliability. Setting rates by simply passing cost increases through a formula rate process limits customers' ability to opine on whether or not increases in prices are justified for the changes in reliability or quality of service.

4. The formula rate process can ignore significant cost components which can cut both ways, and likely will negatively impact customers. For example, changes in cost of capital typically are not picked up in annual formula rate changes. This has caused significant concern over the last ten years as capital market costs have been decreasing significantly. These offsets in capital market costs have balanced and mitigated increases in rates to cover the cost of growing rate base investments.

5. Further, the formula rate process can limit redesigning rates to reflect cost of service, providing economic incentives for conservation and other system benefit and efficiency objectives, and generally to ensure that costs are reflected in rates to all customer classes in a way that reflect cost of service. These class cost of service and rate design aspects typically are not included in formula rate mechanisms.

For all these reasons, the Company's outline of a formula rate process should not be approved in this case, and should not be approved without significant customer safeguards.

Q DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A Yes, it does.

Qualifications of Michael P. Gorman

Q PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A Michael P. Gorman. My business address is 16690 Swingley Ridge Road, Suite 140, Chesterfield, MO 63017.

Q PLEASE STATE YOUR OCCUPATION.

A I am a consultant in the field of public utility regulation and a Managing Principal with the firm of Brubaker & Associates, Inc. ("BAI"), energy, economic and regulatory consultants.

Q PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND WORK EXPERIENCE.

A In 1983 I received a Bachelor of Science Degree in Electrical Engineering from Southern Illinois University, and in 1986, I received a Master's Degree in Business Administration with a concentration in Finance from the University of Illinois at Springfield. I have also completed several graduate level economics courses.

In August of 1983, I accepted an analyst position with the Illinois Commerce Commission ("ICC"). In this position, I performed a variety of analyses for both formal and informal investigations before the ICC, including: marginal cost of energy, central dispatch, avoided cost of energy, annual system production costs, and working capital. In October of 1986, I was promoted to the position of Senior Analyst. In this position, I assumed the additional responsibilities of technical leader on projects, and my areas of responsibility were expanded to include utility financial modeling and financial analyses.

In 1987, I was promoted to Director of the Financial Analysis Department. In this position, I was responsible for all financial analyses conducted by the Staff. Among other things, I conducted analyses and sponsored testimony before the ICC on rate of return, financial integrity, financial modeling and related issues. I also supervised the development of all Staff analyses and testimony on these same issues. In addition, I supervised the Staff's review and recommendations to the Commission concerning utility plans to issue debt and equity securities.

In August of 1989, I accepted a position with Merrill-Lynch as a financial consultant. After receiving all required securities licenses, I worked with individual investors and small businesses in evaluating and selecting investments suitable to their requirements.

In September of 1990, I accepted a position with Drazen-Brubaker & Associates, Inc. ("DBA"). In April 1995, the firm of Brubaker & Associates, Inc. was formed. It includes most of the former DBA principals and Staff. Since 1990, I have performed various analyses and sponsored testimony on cost of capital, cost/benefits of utility mergers and acquisitions, utility reorganizations, level of operating expenses and rate base, cost of service studies, and analyses relating to industrial jobs and economic development. I also participated in a study used to revise the financial policy for the municipal utility in Kansas City, Kansas.

At BAI, I also have extensive experience working with large energy users to distribute and critically evaluate responses to requests for proposals ("RFPs") for electric, steam, and gas energy supply from competitive energy suppliers. These analyses include the evaluation of gas supply and delivery charges, cogeneration and/or combined cycle unit feasibility studies, and the evaluation of third-party asset/supply management agreements. I have participated in rate cases on rate

design and class cost of service for electric, natural gas, water and wastewater utilities. I have also analyzed commodity pricing indices and forward pricing methods for third party supply agreements, and have also conducted regional electric market price forecasts.

In addition to our main office in St. Louis, the firm also has branch offices in Phoenix, Arizona and Corpus Christi, Texas.

Q HAVE YOU EVER TESTIFIED BEFORE A REGULATORY BODY?

A Yes. I have sponsored testimony on cost of capital, revenue requirements, cost of service and other issues before the Federal Energy Regulatory Commission and numerous state regulatory commissions including: Arkansas, Arizona, California, Colorado, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Louisiana, Michigan, Mississippi, Missouri, Montana, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, Wyoming, and before the provincial regulatory boards in Alberta and Nova Scotia, Canada. I have also sponsored testimony before the Board of Public Utilities in Kansas City, Kansas; presented rate setting position reports to the regulatory board of the municipal utility in Austin, Texas, and Salt River Project, Arizona, on behalf of industrial customers; and negotiated rate disputes for industrial customers of the Municipal Electric Authority of Georgia in the LaGrange, Georgia district.

Q PLEASE DESCRIBE ANY PROFESSIONAL REGISTRATIONS OR ORGANIZATIONS TO WHICH YOU BELONG.

A I earned the designation of Chartered Financial Analyst ("CFA") from the CFA Institute. The CFA charter was awarded after successfully completing three examinations which covered the subject areas of financial accounting, economics, fixed income and equity valuation and professional and ethical conduct. I am a member of the CFA Institute's Financial Analyst Society.

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Arizona Public Service Company

Total Company
Ocotillo Deferral Adjustment
Declining Balance Recovery - 8.61% WACC
($000)

Line	Description	Asset Balance (1)	ADIT (2)	Rate Base Value (3)	Asset Amort. (4)	Oper. Income And Taxes (5)	Revenue Req. (6)	Taxes Amort. (7)
1	Rate					8.61% [1]		24.75%
2	Year 1	94,872	(23,481)	71,391	9,487	6,147	15,634	(2,348)
3	Year 2	85,385	(21,133)	64,252	9,487	5,532	15,019	(2,348)
4	Year 3	75,898	(18,785)	57,113	9,487	4,917	14,405	(2,348)
5	Year 4	66,410	(16,437)	49,974	9,487	4,303	13,790	(2,348)
6	Year 5	56,923	(14,088)	42,835	9,487	3,688	13,175	(2,348)
7	Year 6	47,436	(11,740)	35,696	9,487	3,073	12,561	(2,348)
8	Year 7	37,949	(9,392)	28,556	9,487	2,459	11,946	(2,348)
9	Year 8	28,462	(7,044)	21,417	9,487	1,844	11,331	(2,348)
10	Year 9	18,974	(4,696)	14,278	9,487	1,229	10,717	(2,348)
11	Year 10	9,487	(2,348)	7,139	9,487	615	10,102	(2,348)
12	Year 11	(0)	(0)	(0)	-	(0)	(0)	-
13	**Total**				**94,872**			**(23,481)**
14	**Net Present Value**					**24,778**	**86,722**	

Sources:
Data Response attachments Staff 5.7 - APS 19RC01644_RB and Staff 5.7 - APS 19RC01641_IS.
[1] Pre-tax ROR on original cost rate base, Direct Testimony of Christopher C. Walters.

Arizona Public Service Company

Total Company
Ocotillo Deferral Adjustment
Levelized Recovery - 4.10% Cost of Debt
($000)

Line	Description	Asset Balance (1)	ADIT (2)	Rate Base Value (3)	Asset Amort. (4)	Oper. Income And Taxes (5)	Revenue Req. (6)	Taxes Amort. (7)
1	Rate					4.10% [1]		24.75%
2	Year 1	94,872	(23,481)	71,391	8,243	2,927	11,170	(2,040)
3	Year 2	86,629	(21,441)	65,188	8,498	2,673	11,170	(2,103)
4	Year 3	78,131	(19,337)	58,794	8,760	2,411	11,170	(2,168)
5	Year 4	69,371	(17,169)	52,202	9,030	2,140	11,170	(2,235)
6	Year 5	60,341	(14,934)	45,407	9,309	1,862	11,170	(2,304)
7	Year 6	51,033	(12,631)	38,402	9,596	1,574	11,170	(2,375)
8	Year 7	41,437	(10,256)	31,181	9,892	1,278	11,170	(2,448)
9	Year 8	31,545	(7,807)	23,737	10,197	973	11,170	(2,524)
10	Year 9	21,348	(5,284)	16,064	10,512	659	11,170	(2,602)
11	Year 10	10,836	(2,682)	8,154	10,836	334	11,170	(2,682)
12	Year 11	(0)	0	(0)	0	(0)	-	(0)
13	**Total**				**94,872**			**(23,481)**
14	**Net Present Value**					**14,350**	**90,152**	

Sources:
Data Response attachments Staff 5.7 - APS 19RC01644_RB and Staff 5.7 - APS 19RC01641_IS.
[1] APS Schedule D-1.

Data Request Responses Supporting the Direct Testimony of FEA Witness Michael P. Gorman

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FEDERAL EXECUTIVE AGENCIES'
FIRST SET OF DATA REQUESTS TO
ARIZONA PUBLIC SERVICE COMPANY REGARDING
THE APPLICATION TO APPROVE RATE SCHEDULES DESIGNED TO
DEVELOP A JUST AND REASONABLE RATE OF RETURN
DOCKET NO. E-01345A-19-0236
FEBRUARY 14, 2020

FEA 1.26: Referring to Schedule B-1, page 1, please provide a complete explanation of the following:

a. The regulatory assets including the pension expense included in this component. For inclusion in the pension expense, please provide all Commission precedent that allows APS to include a pension asset as a regulatory asset in this line item for rate base.

b. The Company includes a nuclear decommissioning trust of $945,886,000 on an ACC basis. Please provide a reference to all Commission approvals for inclusion of a nuclear decommissioning trust in the original cost rate base, and explain why it is appropriate to include this asset in rate base.

Response:

a. Please refer to ExcelAPSRC00598 for a description of the regulatory assets included on SFR B-1. Commission precedents that allow APS to include the pension asset as a regulatory asset in rate base are Decision Nos. 69663, 71448, 73183 and 76295.

b. Commission approvals for inclusion of a nuclear decommissioning trust in rate base are Decision Nos. 55931, 55939, 57649, 58644, 64393, 67744, and 69663. The Nuclear Decommissioning Trust asset is included as a rate base addition while the corresponding future Decommissioning liability is included as a rate base reduction. Both rate base items are required to account for future decommissioning costs related to the Palo Verde Generating Station.

Witness: Elizabeth Blankenship

ARIZONA PUBLIC SERVICE COMPANY
NET REGULATORY ASSETS INCLUDED IN RATE BASE
TEST YEAR ENDED 6/30/2019
(dollars in thousands)

Line No.	Account Description	Total Ending Balance 6/30/2019	Footnote
	REGULATORY ASSETS		
1.	Pension	$ 712,908	(a)
2.	Deferred Income Taxes on AFUDC	158,845	(b)
3.	Unrecovered Power Plant Costs-Navajo	82,833	(c)
4.	Unrecovered Power Plant Costs-Cholla	81,063	(d)
5.	Property Tax deferral	70,641	(e)
6.	Four Corners deferral	44,266	(f)
7.	SCR debt deferral	37,919	(g)
8.	Investment Tax Credit Basis Adjustment	26,249	(h)
9.	Navajo Coal Reclamation	17,797	(i)
10.	Regulatory Treatment of CIAC on the Mead-Phoenix Transmission Line	10,210	(j)
11.	Unrecovered Power Plant Costs-West Phx	9,982	(k)
12.	Ocotillo Deferral	9,495	(l)
13.	Unrecovered Power Plant Costs-Saguaro	7,426	(m)
14.	OPEB Subsidy PPACA	7,007	(n)
15.	AG-X deferral	6,897	(o)
	SUBTOTAL	$ 1,283,538	

(a) Accounting standard codification 980-715 requires us to recognize the over/under funded positions of our pension and other postretirement benefit plans on our balance sheet.

(b) Represents the "gross-up" income tax effect of AFUDC-equity. Since AFUDC-equity is non-taxable, a regulatory asset and deferred income tax liability is created to account for this book/tax difference. The regulatory asset reflects the future turn-around.

(c) Navajo Generating Station shut down in 2019. Under GAAP rules, the net book value of Navajo from property plant and equipment is reclassified to a regulatory asset when it becomes probable of "early" shut-down.

(d) Cholla unit 2 ceased operations in 2015. Under GAAP rules, the net book value of Cholla Unit 2 from property plant and equipment is reclassified to a regulatory asset when it becomes probable of "early" shut-down.

(e) Property tax deferral per ACC order #73183.

(f) APS's acquisition of SCE's interest in Units 4 and 5. Per Decision No. 73130, APS is authorized to defer, for later recovery through rates, all non-fuel costs of owning, operating, and maintaining the acquired SCE interest in FC Units 4 and 5 and associated facilities, as well as all unrecovered costs associated with FC Units 1-3 and additional costs incurred in connection with the closure of FC Units 1-3. Decision No. 74876 granted APS permission to amortize the approved deferral amount over a ten year peiord.

(g) Selective Catalytic Reduction ("SCR") equipment at the Four Corners Generating Station. Decision No. 76295 authorized APS to defer these costs for future recovery.

(h) Primarily relates to investment tax credit on solar plant in service.

(i) Deferred costs which will be amortized through fuel expense.

(j) Reflects the accelerated amortization of CIAC on Mead Phoenix Line per Decision No. 57459. This accelerated amortization reduced depreciation and cost of service during the 10-year acceleration period. The resulting regulatory asset reflects the future turn-around on this item.

(k) Decommissioning costs related to the retirement of West Phoenix Steam units 4-6 .

(l) Ocotillo Modernization Project ("OMP") deferred non-fuel costs of (i) owning, operating, and maintaining the new generating assets at the Ocotillo site; and (ii) retiring the existing steam generation as authorized in Decision No. 76295.

(m) Saguaro Steam units retired in 2013. Under GAAP rules, the net book value of Cholla Unit 2 from property plant and equipment is reclassified to a regulatory asset when it becomes probable of "early" shut-down

(n) Relates to tax benefits previously recognized, but which will not be realized under the Patient Protection and Affordable Care Act

(o) ACC Decision No. 75322, APS was allowed to defer the unrecovered costs imputed to AG-1 (formerly AG-X) customers, including a debt and equity return. APS was permitted to defer 90% of the first $10 million of unrecovered costs following 6/30/2016 and 100% of the costs after that. The unrecovered costs are essentially unrecovered non-fuel costs of generation less the sum of revenues produced by administrative fees, capacity reservation charges and a portion of off-system sales margins

FEDERAL EXECUTIVE AGENCIES'
FIFTH SET OF DATA REQUESTS TO
ARIZONA PUBLIC SERVICE COMPANY REGARDING
THE APPLICATION TO APPROVE RATE SCHEDULES DESIGNED TO
DEVELOP A JUST AND REASONABLE RATE OF RETURN
DOCKET NO. E-01345A-19-0236
AUGUST 13, 2020

FEA 5.6: Referring to APS Response to AECC 10.1, Item E, the Company states that its pension regulatory asset was recorded in an effort to offset the OCI recorded on its balance sheet. With respect to this answer, please provide the following:

a. Please identify the change in cash positions or cost to APS from this proposed development of a regulatory asset that offsets the OCI component of common equity.

b. Please describe the impact on APS's balance sheet, both the asset side and liability side produced by the creation of regulatory asset and a reduction to the OCI component of common equity.

c. Please confirm that the OCI is recorded in the Company's balance sheet, using generally accepted accounting principles.

d. Please confirm that the FASB 71 creation of regulatory asset and liability with respect to the pension regulatory asset is not included in FERC Form 1 financial statements filed at FERC, or included in financial statements filed with securities and exchange Commissions.

e. Please explain whether or not this regulatory asset will be carried by APS after the end of this rate case.

f. Please explain whether or not this regulatory asset was carried on APS's financial statement before it filed this rate case.

Response:

a. There is no change in cash positions or cost to APS related to the creation of the regulatory asset on December 31, 2006.

b. The impact of the creation of the pension regulatory asset is to debit the regulatory asset instead of the other comprehensive loss. As a result, the Regulatory assets line in the Deferred Debits section of the APS Balance Sheet is increased instead of increasing the Accumulated Other Comprehensive Loss in the Capitalization section. The pension regulatory asset was created in December 2006 by a debit to the regulatory pension asset and a credit to the pension liability account.

c. Yes, the OCI is recorded in the Company's balance sheet using Generally Accepted Accounting Principles.

Witness: Elizabeth Blankenship

FEDERAL EXECUTIVE AGENCIES'
FIFTH SET OF DATA REQUESTS TO
ARIZONA PUBLIC SERVICE COMPANY REGARDING
THE APPLICATION TO APPROVE RATE SCHEDULES DESIGNED TO
DEVELOP A JUST AND REASONABLE RATE OF RETURN
DOCKET NO. E-01345A-19-0236
AUGUST 13, 2020

Response to FEA 5.6 (continued):

d. Pension regulatory asset is included in both, FERC Form 1 financial statement filed at FERC and the financial statements filed with Securities and Exchange Commission.

e. Yes, the regulatory pension asset will be carried after the end of this rate case.

f. Yes, this asset was created on December 31, 2006. Please refer to the Company's response to AECC 10.1 Item A, for the explanation of the pension asset creation.

FREEPORT MINERALS CORPORATION AND
ARIZONANS FOR ELECTRIC CHOICE AND COMPETITION'S
TENTH SET OF DATA REQUESTS TO
ARIZONA PUBLIC SERVICE COMPANY REGARDING
THE APPLICATION TO APPROVE RATE SCHEDULES DESIGNED TO
DEVELOP A JUST AND REASONABLE RATE OF RETURN
DOCKET NO. E-01345A-19-0236
MARCH 10, 2020

AECC 10.1: **Pension Regulatory Asset.** Please refer to EAB-WP5DR, Schedule B-1 Work Paper, page 5, line 1.

a. Please state plainly (i.e., without reference to Footnote (a) in the work paper) why this item is included in rate base as a regulatory asset.

b. Does APS earn a return on this Pension regulatory asset in rate base? If so, what is the rationale for requiring customers to pay APS a return on this item? What benefit has been provided to customers from this regulatory asset?

c. Does this item represent unrecognized actuarial losses?

d. To the best of APS's knowledge, has the ACC explicitly addressed and approved the inclusion of this Pension regulatory asset in rate base for APS? If so, please cite the relevant order(s).

e. Referring to Footnote (a) in the workpaper: where does the offset that is reported in Other Comprehensive Income appear in APS's revenue requirement in this case? Please cite to schedules.

f. Is the $712.9 million amount a Total Electric or ACC jurisdictional amount? If the former, please provide the ACC jurisdictional amount. If the latter, please provide the Total Electric amount.

g. Please explain fully the relationship between the $712.9 million entry on line 1 to the $207.6 million entry provided in APS's Response to Initial 1.48(a). What is the conceptual relationship between these balances? Please reconcile these amounts.

Response: a) This regulatory asset account was created as a direct result of the Company's adoption of Accounting Standards Codification (ASC) 715 (Compensation – Retirement Benefits) on December 31, 2006. The funded status of pension and other postretirement benefit plan at December 31, 2006 is required by GAAP to be reported as an asset (for over-funded plans) or a liability (for under-funded plans) with the offset recorded to OCI (Other Comprehensive Income/Loss). The pension plan is under-funded and reported as a liability. FAS 71 accounting allows the regulated utility (APS) to establish a regulatory asset/liability to record the offset to the funded status adjustments instead of an offset to Other Comprehensive Income/Loss. Please see also APS's response to part (b).

Witness: Elizabeth Blankenship

FREEPORT MINERALS CORPORATION AND
ARIZONANS FOR ELECTRIC CHOICE AND COMPETITION'S
TENTH SET OF DATA REQUESTS TO
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Response to AECC 10.1 (continued):

b) Yes, APS earns a return on the Pension regulatory asset in rate base similar to other items included in rate base. Please refer to the Commission precedents that allow APS to include the pension asset as a regulatory asset, Decision Nos. 69663, 71448, 73183 and 76295.

c) Yes, this amount represents unamortized net actuarial loss.

d) Please see APS's response to part b.

e) Per GAAP, the offset to the funded status adjustment is traditionally recorded to OCI. However, FAS 71 accounting allows the regulated utility (APS) to establish a regulatory asset/liability to record the offset to the funded status adjustment instead of OCI. The offset amount to pension underfunded status reported as liability is recorded as a regulatory asset instead of Other Comprehensive Loss.

f) The $712.9 million recorded for APS is a Total Company amount. Please see line 16 on Schedule B-1 for the total regulatory assets ACC jurisdiction amount.

g) The $207.6 million is the under-funded status at 06/30/2019 of the pension plan recorded as liability. $712.9 million is the unamortized portion of the actuarial loss. On a bi-annual basis, a year-end valuation is received from the actuary which calculates the funded status of all pension plans. Bi-annual adjustments for the valuation received from the actuary are recorded to the funded status liability with offset to the regulatory asset for APS share. Reconciliation at 06/30/2019 for these accounts is provided below.

	Amounts in millions	
Funded Status at 12/31/2018	$	(296.0)
January - June expense		(2.8)
Contribution		89.7
Mid-Year Adjustment		1.5
Total Funded Status at 06/30/2019		(207.6)
Regulatory asset at 12/31/2018	$	733.3
January - June amortization		(18.9)
Mid-Year Adjustment		(1.5)
Total Regulatory Asset at 06/30/2019		712.9

FREEPORT MINERALS CORPORATION AND
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AECC 10.4: **Pension expense.** Please refer to the table below and identify each of the components of APS's net periodic pension cost for each year 2016-2019, as well as projections for 2020 and 2021.

Components of Net Periodic Pension Cost

	Service Cost
+	Interest Cost
-	Expected Return on Plan Assets
+	Amortization of Prior Period Service Cost
+/-	Amortization of Actuarial Gains/Losses
=	Annual Net Periodic Pension Cost

Response: Please see below for the APS's net periodic pension cost for the years 2016-2020 (dollars in thousands). The 2020 projected pension cost is provided by the actuary. The 2021 projected pension cost will not be available until January of 2021.

	2020	**2019**	**2018**	**2017**	**2016**
Service Cost	$ 54,910	$ 47,439	$ 53,705	$ 51,990	$ 51,490
Interest Cost	112,930	129,524	118,114	122,516	124,316
Expected Return on Plan Assets	(186,627)	(171,334)	(182,231)	(173,347)	(173,228)
Amortization of Prior Period Service Cost	–	–	–	81	90
Amortization of Actuarial Gains/Losses	30,128	37,785	26,108	42,613	35,794
Annual Net Periodic Pension Cost	**$ 11,341**	**$ 43,414**	**$ 15,696**	**$ 43,853**	**$ 38,462**

Witness: Elizabeth Blankenship

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AECC 10.5: **Pension expense.** Does the APS pension plan(s) have any unrecognized losses? If so, please identify the amount for each year from 2016-2019, and projected amounts for 2020 and 2021.

Response: Yes, the APS pension plan has net unamortized loss. Please see below for the APS pension plan net unamortized losses for the years ended 2016-2019 (dollars in thousands). The projected amounts for 2020 and 2021 are not available at this time.

	2019	**2018**	**2017**	**2016**
Net unamortized loss – APS regulatory asset	$660,223	$733,351	$576,188	$710,977

Witness: Elizabeth Blankenship

FREEPORT MINERALS CORPORATION AND
ARIZONANS FOR ELECTRIC CHOICE AND COMPETITION'S
THIRTEENTH SET OF DATA REQUESTS TO
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MARCH 26, 2020

AECC 13.4: **Pension Asset**. Please refer to APS's response to AECC 10.1(f), which asked for the ACC jurisdictional amount associated with the $712.9 million Total Company pension asset. APS's response refers only to the ACC jurisdictional amount of all regulatory assets in the aggregate. Please provide the specific ACC jurisdictional amount associated with the $712.9 million Total Company pension asset as previously requested in AECC 10.1(f).

Response: Pension Asset is a component of "Regulatory Assets and Liabilities" and is functionalized on wages and salaries with an ACC jurisdictional allocation of 91.8%. Please see line 485 in the Cost of Service tab in LRS-WP11DR.

Witness: Leland Snook

FREEPORT MINERALS CORPORATION AND ARIZONANS FOR ELECTRIC CHOICE AND COMPETITION'S THIRTEENTH SET OF DATA REQUESTS TO ARIZONA PUBLIC SERVICE COMPANY REGARDING THE APPLICATION TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP A JUST AND REASONABLE RATE OF RETURN
DOCKET NO. E-01345A-19-0236
MARCH 26, 2020

AECC 13.7: **Pension Asset**. Please refer to APS's response to AECC 10.1(b), which contends that Commission precedents allow APS to include the pension asset in rate base as a regulatory asset according to Decision Nos. 69663, 71448, 73183 and 76295. Admit that none of the cited orders contains an explicit discussion of, or reference to, the inclusion of the pension asset in rate base as a regulatory asset. If denied, please cite to the specific page numbers from those decisions in which the Commission explicitly stated that it was approving inclusion of the pension asset in rate base as a regulatory asset.

Response: Regulatory assets (overfunded) and liabilities (underfunded) for pension benefits have been included in the Company's rate base since at least 2005 (Decision No. 67744 dated April 7, 2005) as evidenced by their inclusion in Standard Filing Requirement Schedule B-1 and itemized in Schedule B-1 workpapers. B-1 was sponsored by APS witness Bill Post.

Although not explicitly addressed in each of the Decisions mentioned in the Company's response to AECC 10.1(b), the pension asset is an investment in APS's employees and therefore treated in rate base in the same manner as other investments, such as a distribution substation or generating plant.

As part of a rate case, Staff and intervenors review the Company's revenue and expense as set forth in its Standard Filing Requirements through the discovery process and propose adjustments for the Commission's consideration based on their individual reviews. The fact that there is no discussion in these decisions regarding a pension asset or liability shows that this treatment of pension expense is accepted ratemaking practice.

Witness: Elizabeth Blankenship

ARIZONA CORPORATION COMMISSION STAFF'S
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Staff 5.7: **Errors**. As the Company discovers errors in its filing, identify such errors and provide documentation to support any changes. Please update this response as additional information becomes available.

Response:

Number	*Item*	*Description*
1	Cost Allocation	Allocate Four Corners deferral income statement and rate base pro forma to all ACC
2	Miscellaneous/Out of period pro forma	Add removal of $700k of Bain costs
3	WP 4 Disallowance adjustment	Change needed, described in APS's response to AECC 2.2
4	OMP & 4C SCR deferral	Change needed, described in APS's response to AECC 2.3 - debt return amounts were not accurate due to incorrect tax depreciation rates
5	Cost Allocation	Allocate retired power plant deferred taxes to total system benefits, not retail system benefits
6	Cost Allocation	Reg assets and liabilities
7	Base Fuel Pro Forma	Adjust sales in base fuel pro forma to account for customer annualization
8	Crisis Bill Pro Forma	Incorrectly categorized as revenue, not expense
9	Load Research	Update sales amounts for AGX, E-32M and L-TOU, and non-TOU, which are currently overstated

Supplemental Response:

10	AG-X Charges	See APS's response to Calpine 1.1
11	Transmission Expense	Expense for March 2019 was omitted from model, however, transmission revenues for March were included, resulting in an understatement of revenue requirement

Witness: All

ARIZONA CORPORATION COMMISSION STAFF'S
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Second Supplemental Response:

12	Updated Allocation Factors and COSS Model	See APS's response and supplemental response to AECC 19.11

Third Supplemental Response:

Upon further review, items 5 and 6 above have been determined not to be erroneous.

13	Minor differences in generation level energy for non-AG-X customers between tabs	See APS's response to AECC 21.8

Please also see the table below for additional workpapers for several errors listed above:

Number	Item	Attachment
2	Miscellaneous/Out of period pro forma update	ExcelAPS19RC01637
3	WP 4 Disallowance pro forma update	ExcelAPS19RC01636
4	OMP deferral pro forma update	ExcelAPS19RC01641
4	4C SCR deferral pro forma update	ExcelAPS19RC01640

APS is still analyzing the COSS impacts from the above errors and will provide that information as soon as it is available.

Fourth Supplemental Response:

Please see the table below for additional workpapers for the rate base impacts for several errors listed above. The attachments provided in the 3rd supplemental response above are the income statement impacts (as the file names state).

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Fourth Supplemental Response to Staff 5.7 (continued):

Number	Item	Attachment
3	WP 4 Disallowance pro forma update	ExcelAPS19RC01648
4	OMP deferral pro forma update	ExcelAPS19RC01644
4	4C SCR deferral pro forma update	ExcelAPS19RC01643

Please also see attachment APS19RC01679 for the COSS impacts of the above-mentioned errors, except error 14 above. This includes the fixes for the errors referenced in AECC 19.11 and AECC 21.5.

Fifth Supplemental Response:

Number	*Item*	*Description*	*Estimated Impact*
14	E-32 Storage Pilot in POR	This rate mistakenly had charges left blank in the "Proposed" tab of the POR, but the rates are correctly displayed on the E-32L tab	No impact on revenue request
15	AG-X PSA Provision	Please see the Company's response to AECC 23.2	Reduction of $15M in the revenue request

Sixth Supplemental Response:

Number	*Item*	*Description*	*Estimated Impact*
16	RCND Study	As noted in RUCO 6.10, APS identified an error in the initial RCND study. An updated study was provided in the supplemental response to RUCO 6.10	Reduction of $2M in the revenue request

Please also see attachment ExcelAPS19RC02085 for an updated COSS study (that builds on the corrections made in APS19RC01679) which includes the impacts of error 15 and 16 above. This attachment also includes the update from Staff 15.3 to include actuals from the 12-month PTYP period. Please also see attachment APS19RC02086 for the updated allocation factor report and the allocation factor workpaper ExcelAPS19RC02102.

ARIZONA PUBLIC SERVICE COMPANY
Income Statement Pro Forma Adjustments
Test Year Ended 6/30/2019
(Dollars in Thousands)

Line No.	Description	Ocotillo Deferral Total Co.
	Electric Operating Revenues	
1.	Revenues from Base Rates	$ -
2.	Revenues from Surcharges	-
3.	Other Electric Revenues	-
4.	Total Electric Operating Revenues	-
5.	Electric Fuel and Purchased Power Costs	-
6.	Oper Rev Less Fuel & Purch Pwr Costs	-
	Other Operating Expenses:	
7.	Operations Excluding Fuel Expense	-
8.	Maintenance	-
9.	Subtotal	-
10.	Depreciation and Amortization	9,487
11.	Amortization of Gain	-
12.	Administrative and General	-
13.	Other Taxes	-
14.	Total Other Operating Expense	9,487
15.	Operating Income Before Income Tax	(9,487)
16.	Interest Expense	-
17.	Taxable Income	(9,487)
18.	Current Income Tax Rate - **24.75% (Line 17 * 24.75%)**	(2,348)
19.	Operating Income (line 15 minus line 18)	$ (7,139)

This proforma adjusts the test year income statement to reflect the ocotillo deferral that will have been deferred starting 2019

Summary

Ocotillo Deferral Balance as of 12/31/2020	94,871,889
Monthly Amortization*	790,599.08

* Assumes a 10-year life for deferral asset

Estimated Amortization

Month	***Amount***
January	790,599
February	790,599
March	790,599
April	790,599
May	790,599
June	790,599
July	790,599
August	790,599
September	790,599
October	790,599
November	790,599
December	790,599
	9,487,189

ARIZONA PUBLIC SERVICE COMPANY
Pro Forma Adjustments to Original Cost Rate Base
Test Year Ended 6/30/19
(Thousands of Dollars)

Line No.	Description		Ocotillo Deferral Total Co.
1.	Gross Utility Plant in Service		$ -
2.	Less: Accumulated Depreciation and Amortization		-
3.	Net Utility Plant in Service		-
4.	Less: Total Deductions	**EAB-WP12DR page 2 [A]**	21,131
5.	Total Additions	**EAB-WP12DR page 2 [B]**	85,377
6.	Total Rate Base		$ 64,246

Adjustment to Test Year rate base to include the estimated Ocotillo Modernization Project deferral from July 1, 2019 to December 31, 2020 per ACC Decision No.76295.

ARIZONA PUBLIC SERVICE
Ocotillo Deferral Asset
Test Year Ended 06/30/2019

	Actuals	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	
Cost	July 2019 - June 2020	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Total
Debt Return	27,835,310	2,264,151	2,255,322	2,174,026	2,237,664	2,156,938	2,220,007	41,143,417
Property Taxes	5,964,542	584,522	584,522	584,522	584,522	584,522	584,522	9,471,674
Depreciation	19,924,459	1,659,691	1,659,691	1,659,691	1,659,691	1,659,691	1,659,691	29,882,608
O&M Costs	2,351,494	432,503	432,503	432,503	432,503	432,503	364,841	4,878,849
	56,075,805	4,940,867	4,932,038	4,850,742	4,914,381	4,833,654	4,829,061	85,376,548
Tax Rate	24.75%	24.75%	24.75%	24.75%	24.75%	24.75%	24.75%	
Deferred Tax Liability	13,878,762	1,222,865	1,220,680	1,200,559	1,216,309	1,196,329	1,195,193	21,130,696

Arizona Public Service Company

Pension - Other Comprehensive Income Adjustment
($000)

Line	Description	Amount (1)	Weight (2)	Cost (3)	Weighted Cost (4)	Pre-Tax Weighted Cost (5)
	APS Proposed Capital Structure[1]					
1	Common Equity	$ 5,700,968	54.67%	10.15%	5.55%	7.37%
2	Long-Term Debt	4,726,125	45.33%	4.10%	1.86%	1.86%
3	Total	$ 10,427,093	100.00%		7.41%	9.23%
4	Tax Conversion Factor[2]					1.3288
	Pension OCI[3]					
5	Pension OCI to Zero Adjustment	$ (26,298)				
	Adjusted Capital Structure					
6	Common Equity	$ 5,674,670	54.56%	10.15%	5.54%	7.36%
7	Long-Term Debt	4,726,125	45.44%	4.10%	1.86%	1.86%
8	Total	$ 10,400,795	100.00%		7.40%	9.22%
9	Difference				0.01%	0.01%
10	Original Cost Rate Base ($000)					$ 8,872,984
11	Revenue Requirement Impact					$ 1,179

Sources:
[1] Schedule D-1, page 1.
[2] Schedule A-1.
[3] Schedule D-1, page 2.

BEFORE THE

ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF ARIZONA PUBLIC SERVICE COMPANY FOR A HEARING TO DETERMINE THE FAIR VALUE OF THE UTILITY PROPERTY OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN	**DOCKET NO. E-01345A-19-0236**

Direct Testimony and Exhibits of

Christopher C. Walters

On behalf of

Federal Executive Agencies

October 2, 2020

BRUBAKER & ASSOCIATES, INC.

Project 10899

BEFORE THE

ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF ARIZONA PUBLIC SERVICE COMPANY FOR A HEARING TO DETERMINE THE FAIR VALUE OF THE UTILITY PROPERTY OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN	**DOCKET NO. E-01345A-19-0236**

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ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF ARIZONA PUBLIC SERVICE COMPANY FOR A HEARING TO DETERMINE THE FAIR VALUE OF THE UTILITY PROPERTY OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN	**DOCKET NO. E-01345A-19-0236**

Direct Testimony of Christopher C. Walters

I. INTRODUCTION

Q PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A Christopher C. Walters. My business address is 16690 Swingley Ridge Road, Suite 140, Chesterfield, MO 63017.

Q WHAT IS YOUR OCCUPATION?

A I am a consultant in the field of public utility regulation and an Associate of the firm, Brubaker & Associates, Inc. ("BAI"), energy, economic and regulatory consultants.

Q PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND EXPERIENCE.

A This information is included in Appendix A to this testimony.

Q ON WHOSE BEHALF ARE YOU APPEARING IN THIS PROCEEDING?

A I am testifying on behalf of the Federal Executive Agencies ("FEA"), consisting of certain agencies of the United States government, which have offices, facilities, and/or installations in the service area of Arizona Public Service Company ("APS" or "Company"), from whom they purchase electricity and energy services.

Q WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A My testimony will address the current market cost of equity, and resulting overall rate of return ("ROR") for APS. In my analyses, I consider the results of several market models, the current and expected economic environment, as well as the outlook for the regulated utility industry.

My silence with respect to any position taken by APS in its application or direct testimony in this proceeding should not be interpreted as an endorsement of that position.

II. SUMMARY

Q PLEASE SUMMARIZE YOUR RECOMMENDATIONS AND CONCLUSIONS.

A In Section III of my testimony, I review and analyze the regulated utility industry's access to capital, credit rating trends and outlooks, as well as the overall trend in the authorized return on equity ("ROE") for utilities throughout the country. I conclude that the trend in authorized ROEs for utilities has declined over the last several years and has remained well below 10.0% more recently. I also review the impact that the Federal Reserve's monetary policy actions have had on the cost of capital.

In Section IV of my testimony, I outline how a fair ROE should be established, provide an overview of the market's perception of APS's investment risk, comment on

the Company's proposed capital structure, and present the analyses I relied on to estimate an appropriate ROE for APS. Based on the results of several cost of equity estimation methods performed on publicly traded electric utility Companies with comparable risk to the Company, I recommend the Commission award APS a return on common equity of 9.3%, which is the midpoint of my recommended range of 9.0% to 9.6%. My recommended ROE of 9.3%, along with the Company's requested capital structure and embedded cost of debt produces an overall ROR of 6.94% on original cost rate base ("OCRB") as shown on my Attachment CCW-1DR. This ROE will fairly compensate APS for its current market cost of common equity by fairly balancing the interests of investors and ratepayers.

In Section V of my testimony, I respond to the testimony, analysis, and recommendations offered by APS witness, Ms. Ann E. Bulkley as it pertains to her ROE recommendation of 10.15%. I show that Ms. Bulkley's recommendations are excessive due to her application of certain models that produce overstated results. When certain adjustments and corrections are applied to her analytical methods, her models support my recommended range and ROE of 9.3% for APS.

In Section VI of my testimony, I respond to the testimony, analysis, and recommendations offered by Ms. Bulkley as it pertains to her recommended 1.0% cost rate for the fair value increment. I also describe the analyses supporting my 0.65% recommendation for the cost rate to be applied to the fair value increment. Incorporating this cost rate for the fair value increment produces an ROR on FVRB of 5.18%. Collectively, my adjustments to the Company's overall rate of return, including the fair value increment, reduce the overall revenue requirements by approximately $70.3 million. The fair value increment would be reduced from $45.6 million to $30.7 million

III. ACCESS TO CAPITAL AND ECONOMIC ENVIRONMENT

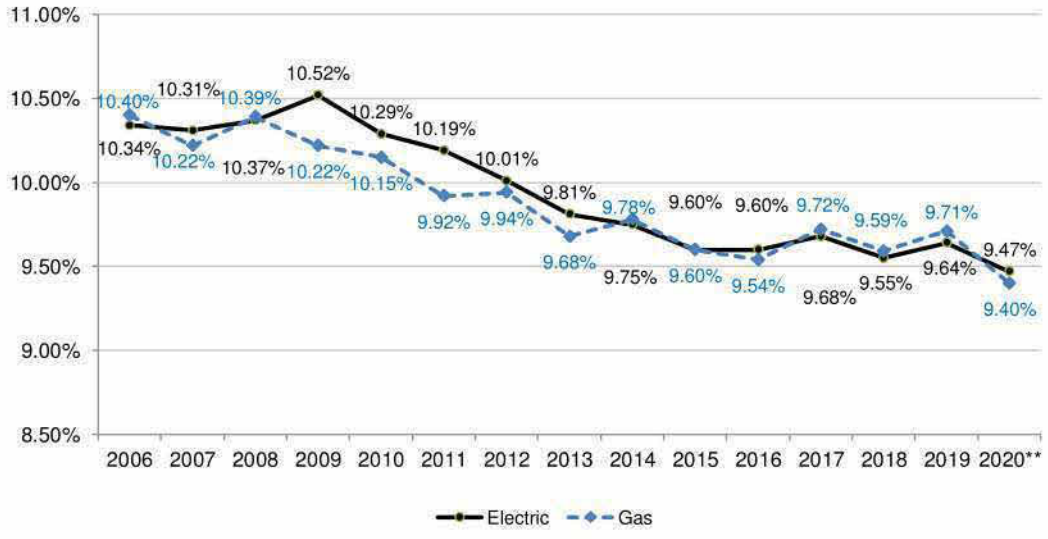
III.A. Electric Industry Authorized ROEs, Access to Capital, and Credit Strength

Q PLEASE DESCRIBE THE OBSERVABLE EVIDENCE ON TRENDS IN AUTHORIZED ROEs FOR ELECTRIC AND GAS UTILITIES, UTILITIES' CREDIT STANDING, AND UTILITIES' ACCESS TO CAPITAL TO FUND INFRASTRUCTURE INVESTMENT.

A Authorized ROEs for both electric and gas utilities have declined over the last ten years, as illustrated in Figure 1, and have been reasonably stable well below 10.0% for about the last six years.

FIGURE 1

Authorized Returns on Equity*
(Exclude Limited Issue Riders)



Source and Notes:
[7] *S&P Global Market Intelligence*, RRA Regulatory Focus, Major Rate Case Decisions -- January - June 2020, July 22, 2020 at page 1.
* Electric Returns exclude Limited Issue Riders.
* RRA excludes the 2017 Alaska ENSTAR decision from its calculations.
**Data represents January - June.

Q PLEASE DESCRIBE THE DISTRIBUTION OF AUTHORIZED ROEs FOR THE LAST FEW YEARS.

A The distribution of authorized returns, annually, since 2016 is summarized in Table 1.

TABLE 1

Distribution of Authorized ROEs
(All Electric Utilities)*

Line	Year	Average (1)	Median (2)	Share of Decisions ≤ 9.5% (3)	Share of Decisions ≤ 9.7% (4)
1	2016	9.60%	9.60%	41%	53%
2	2017[1]	9.67%	9.60%	42%	67%
3	2018[2]	9.54%	9.57%	47%	63%
4	2019	9.64%	9.65%	39%	58%
5	2020 Q2[3]	9.46%	9.48%	56%	72%

Source and Notes:
S&P Global Market Intelligence, data through 6/30/2020.
[1]Includes authorized base ROE of 9.4% for Nevada Power Company, which excludes incentives associated with the Lenzie facility.
[2]Includes authorized base ROE of 9.6% for Interstate Power & Light Co., which excludes allowed ROE for generating facilities subject to special ratemaking principles.
[3]Includes authorized base ROE of 9.8% for Interstate Power & Light Co., which excludes allowed ROE for generating facilities subject to special ratemaking principles.
*Excludes Limited Issue Rider Cases.

The distribution shows that over the last few years, the majority of authorized ROEs since 2016 have been below 9.7%, with many of those being below 9.5%.

Q HOW HAS THE AUTHORIZED COMMON EQUITY RATIO FLUCTUATED OVER THE SAME TIME PERIOD FOR ELECTRIC UTILITIES?

A In general, the electric utility industry's common equity ratio has not really deviated too much from 50.0%. As shown in Table 2, I have provided the authorized common equity ratios for electric utilities around the country, excluding the reported common equity ratios for Arkansas, Florida, Michigan, and Indiana. I have excluded the reported common equity ratios for these states because these jurisdictions include sources of capital outside of investor-supplied capital such as accumulated deferred income taxes. As such, the reported common equity ratios in these states would bias down the reported permanent common equity ratios authorized for ratemaking purposes.

TABLE 2

Trends in State Authorized Common Equity Ratios
(Industry)

		Electric[1]	
Line	Year	Average	Median
	(1)	(2)	(3)
1	2016	49.70%	49.99%
2	2017	50.02%	49.85%
3	2018	50.60%	50.23%
4	2019	51.55%	51.37%
5	2020	50.46%	51.17%
6	Average	50.46%	50.52%
7	Min	49.70%	49.85%
8	Max	51.55%	51.37%

Source and Note:
[1] S&P Global Market Intelligence, data through 6/30/2020.
[2] Excludes Arkansas, Florida, Indiana, and Michigan because they include non-investor capital.

Q HAVE REGULATED UTILITY COMPANIES BEEN ABLE TO MAINTAIN STRONG CREDIT RATINGS DURING PERIODS OF DECLINING AUTHORIZED RETURNS ON EQUITY?

A Yes. The credit rating changes for the electric utility industry over the last several years are the result of marked improvement in overall financial health and credit quality in the industry. As shown below in Table 3, the credit rating of the industry has improved over the last 10 years. More recently, a significant majority (71%) of the electric utility companies have bond ratings in the range of BBB+ to A-. APS's A- bond rating is among the strongest in the electric utility industry.

TABLE 3

S&P Ratings by Category
Electric Utility Subsidiaries
(Year End)

Description	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
A or higher	12%	12%	12%	11%	13%	13%	13%	10%	10%	8%	14%	15%
A-	18%	20%	19%	22%	26%	26%	34%	43%	52%	54%	54%	53%
BBB+	23%	24%	28%	28%	25%	28%	24%	32%	21%	22%	18%	18%
BBB	36%	26%	24%	22%	26%	23%	18%	4%	7%	13%	12%	13%
BBB-	9%	16%	15%	17%	11%	11%	11%	11%	11%	2%	1%	1%
Below BBB-	2%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: S&P CAPITAL IQ, downloaded 05/06/20.
Note: Value Line Electric Subsidiary ratings used.

Q HAVE UTILITIES BEEN ABLE TO ACCESS EXTERNAL CAPITAL TO SUPPORT INFRASTRUCTURE CAPITAL PROGRAMS?

A Yes. In its June 2020 Utility Capital Expenditures Update report, *RRA Financial Focus*, a division of S&P Global Market Intelligence, made several relevant comments about utility investments generally:

- Projected 2020 capital expenditures for the 48 energy utilities in the Regulatory Research Associates', a group with S&P Global Market Intelligence, universe currently stands at roughly $140.9 billion, well above 2019's $121.3 billion in capital investment.

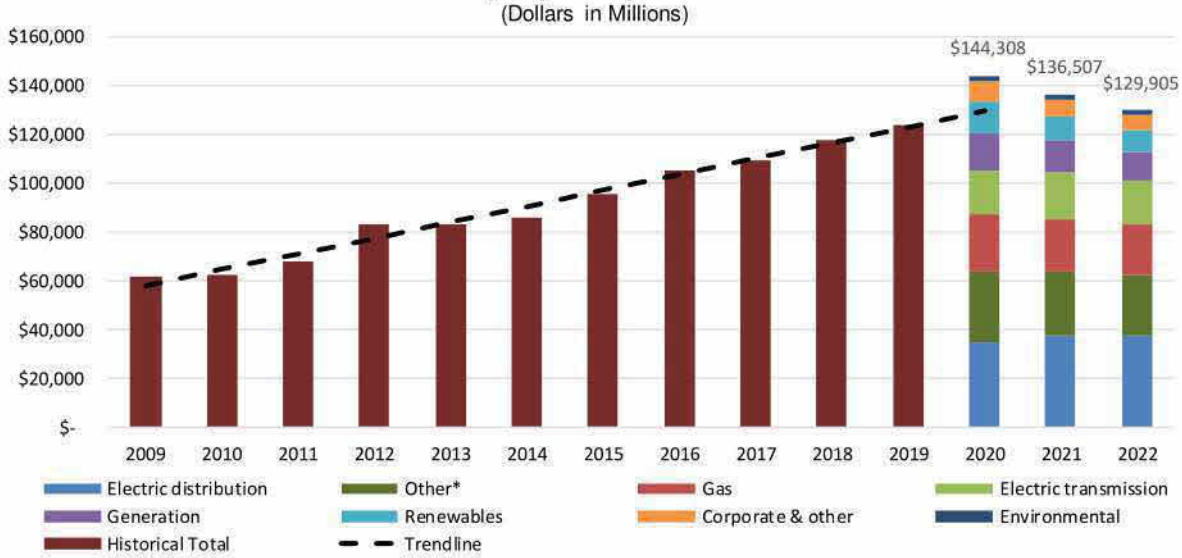
- 2019's energy capital expenditures were a record high, and 5% above the $115.1 billion posted in 2018.

* * *

> The nation's electric and gas utilities are investing in infrastructure to upgrade aging transmission and distribution systems, build new natural gas, solar and wind generation, and implement new technologies, including smart meter deployment, smart grid systems, cybersecurity measures and battery storage. We expect considerable levels of spending to serve as the basis for solid profit expansion for the foreseeable future.[1]

As shown in Figure 2 below, capital expenditures for electric and natural gas utilities have increased considerably over the period 2007 into 2020, and the forecasted capital expenditures remain elevated, but slightly below current levels.

FIGURE 2



*Other category consists of utilities that do not report capital expenditures by category: Avangrid, Hawaiian Electric, PG&E and Portland General Electric.
Source: *S&P Global Market Intelligence, RRA Financial Focus*, Utility Capital Expenditures Update, June 8, 2020, Tables 1 and 3.

As outlined in Figure 2 above, and in the comments made by *RRA S&P Global Market Intelligence*, capital investments for the utility industry continue to stay at elevated levels, and fuel utilities' profit expansion into the foreseeable future. This is

[1] *S&P Global Market Intelligence, RRA Financial Focus*: "Utility Capital Expenditures Update," June 8, 2020, at 1.

clear evidence that the capital investments are enhancing shareholder value, and are attracting both equity and debt capital to the utility industry in a manner that allows for these accelerated capital investment levels, but are doing so under reasonable prices, terms and conditions for the reasons outlined in the credit rating, and strong valuation metrics for the industry.

Q IS THERE EVIDENCE OF ROBUST VALUATIONS OF REGULATED UTILITY EQUITY SECURITIES?

A Yes. Robust valuations are an indication that utilities can sell securities at high prices, which is a strong indication that they can access equity capital under reasonable terms and conditions, and at relatively low cost. As shown on Attachment CCW-2DR, the historical valuation of electric utilities followed by *Value Line*, based on a price-to-earnings ("P/E") ratio, price-to-cash flow ("P/CF") ratio, and market price-to-book value ("M/B") ratio, indicates utility security valuations today are very strong and robust relative to the last several years. These strong valuations of utility stocks indicate that utilities have access to equity capital under reasonable terms and at lower costs.

Q HOW SHOULD THE COMMISSION USE THIS MARKET INFORMATION IN ASSESSING A FAIR RETURN FOR APS?

A Observable market evidence is quite clear that capital market costs are near historically low levels. While authorized ROEs have fallen to the mid 9.0% range, utilities continue to have access to large amounts of external capital even as they are funding large capital programs. Furthermore, utilities' investment-grade credit ratings are mostly stable and have improved due, in part, to supportive regulatory treatment. The

Commission should carefully weigh all this important observable market evidence in assessing a fair ROE for APS.

III.B. Regulated Utility Industry Outlook

Q PLEASE DESCRIBE THE CREDIT RATING OUTLOOK FOR REGULATED UTILITIES.

A As discussed above and expanded upon here, regulated utilities' credit ratings have generally improved over the last few years. Credit analysts have observed that utilities have strong access to capital at attractive pricing (i.e., low capital costs), which has supported very large capital programs.

S&P recently published a report titled "Industry Top Trends 2020: North America Regulated Utilities." In that report, S&P noted the following:

> **We expect that the generally stable North America utility industry will continue to have a relatively high percentage (15%-30%) of issuer credit ratings that either have a negative outlook or are on CreditWatch with negative implications.** Companies are strategically managing their cash flow measures closer to the downgrade threshold with minimum cushion at the current rating level. An unexpected event such as a recession, wildfire, gas explosion, large project delay, or political interference, could all lead to a negative outlook or a downgrade.
>
> **For the industry to maintain its investment-grade credit quality, utilities must continue to manage regulatory risk and manage generally reduced authorized returns on equity (ROEs) and higher capital spending.** Utilities have been able to improve their ability to consistently earn lower authorized ROEs by reducing regulatory lag through the use of forward looking test years, formula rates, multi-year rate orders, increasing use of rider mechanisms, and decoupling mechanisms. Another way some utilities have been able to increase their cash flow in lieu of lower authorized ROEs is by receiving a higher equity component within the regulated capital structure. These approaches highlight some of the tools that utilities have used to preserve credit quality despite the many challenges.[2]

[2] *S&P Global Ratings*: "Industry Top Trends 2020: North America Regulated Utilities," at 6, November 7, 2019.

More recently, the global economy has faced the extraordinary challenges of the novel Coronavirus, which led to nearly a complete shutdown of the global economy. This unprecedented event has impacted all sectors and capital markets. With regard to regulated utilities, S&P made the following statement:

> **Key Takeaways**
> - S&P Global economists' now forecast a global recession this year, with the U.S. expected to post a seasonally adjusted second quarter contraction of about 6% before recovery begins in the second half of the year.
> - We believe that the majority of North American regulated utilities are well positioned to handle the immediate impact of COVID-19. However, the pandemic could negatively affect a few outliers and those issuers already facing downside ratings pressure prior to the arrival of the coronavirus.
> - Some electric utilities with disproportionate exposure to commercial and industrial class of customers could be vulnerable to reduced sales volumes, absent any regulatory counter mechanisms such as decoupling.[3]

At the beginning of April however, S&P changed its outlook for the regulated utility industry to "Negative," due to the uncertainty surrounding COVID-19 and now projects a modest weakening of credit quality within the industry.[4]

Moody's opines that there may be delays in rate case decisions due to COVID-19, but views the regulated utilities resilient to withstand the current economic situation. Specifically, Moody's states:

> When considering the short-term credit implications of coronavirus-related regulatory delays, <u>we will view any modest weakening in financial metrics as temporary and not detrimental to long-term credit quality, unless it is accompanied by a more contentious regulatory or political environment.</u> We will continue to expect utilities to make proactive financial policy adjustments if the dip is material, or appears likely to remain for an extended period of time. For now, we expect state regulatory commissions to continue to provide a broad suite of timely cost recovery mechanisms and to address current challenges like lost revenue and incremental expenses. As a result, we think the overall relationship with the sector remains supportive.

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[3] *S&P Global Ratings*: "North American Regulated Utilities Face Additional Risks Amid Coronavirus Outbreak," March 19, 2020, at 1.

[4] *S&P Global Ratings*: "COVID-19: The Outlook For North American Regulated Utilities Turns Negative," April 2, 2020, at 1.

* * *

> **We will generally try to see through one- or two-year drags on financial metrics due to these delays.** We assume that the pandemic will be contained by then, that economic activity will recover and that the rate increases will eventually be approved, including some of the lost revenues associated with the delay. However, if the US economic downturn were to be protracted, it could have negative credit implications for certain utilities, such as those that have been operating with leverage that we had already considered high before the outbreak.[5]

In a recent report Fitch states:

> The Tax Cuts and Jobs Act signed into law on Dec. 22, 2017 has negative credit implications for U.S. regulated utilities and utility holding Companies over the short-to-medium term, according to Fitch Ratings. A reduction in customer bills to reflect lower federal income taxes and return of excess accumulated deferred income taxes is expected to lower revenues and funds from operations (FFO) across the sector. Absent mitigating strategies on the regulatory front, this is expected to lead to weaker credit metrics and negative rating actions for those issuers that have limited headroom to absorb the leverage creep.

* * *

> Over a longer-term perspective, Fitch views tax reform as modestly positive for utilities. The sector retained the deductibility of interest expense, which would have otherwise significantly impacted cost of capital for this capital intensive sector. The exemption from 100% capex expensing is also welcome news for the sector, which has seen years of bonus depreciation reduce rate base leading to lower earnings. Finally, the reduction in federal income taxes lowers cost of service to customers, providing utilities headroom to increase rates for capital investments.[6]

---

[5] *Moody's Investors Service Sector Comment*: "Regulated Electric, Gas and Water Utilities – U.S: Coronavirus outbreak delays rate cases, but regulatory support remains intact," April 6, 2020 (emphasis added).

[6] *Fitch Ratings*: "Tax Reform Creates Near-term Credit Pressure for U.S. Utilities," January 24, 2018 (emphasis added).

Q HOW IS THIS OBSERVABLE MARKET DATA USED IN FORMING YOUR RECOMMENDED RETURN ON EQUITY AND OVERALL RATE OF RETURN FOR APS?

A Generally, authorized returns on equity, credit standing, and access to capital have been quite robust for utilities over the last several years. The COVID-19 pandemic is creating challenges for the U.S. economy as a whole, which includes utility companies and their customers. However, like the U.S. economy, utilities are expected to weather the economic downturn caused by the pandemic, and their financial strength will be restored as the economy recovers. In the meantime, it is critical that the Commission ensure that rates are increased no more than necessary to provide fair compensation and maintain financial integrity, but be especially concerned about rate impacts on the service area economies that are severely constrained due to the current economic conditions.

III.C. Federal Reserve Monetary Policy

Q HAVE YOU CONSIDERED THE CONSENSUS OUTLOOKS OF INDEPENDENT ECONOMISTS FOR CHANGES IN INTEREST RATES IN FORMING YOUR RECOMMENDED ROE IN THIS CASE?

A Yes. The consensus of independent economists indicates that they are expecting the Federal Reserve's monetary policy actions, as directed by the Federal Open Market Committee ("FOMC"),[7] will keep the Federal Funds Rate at decreased levels for the near term. This is evident from a comparison of current and forecasted changes in the Federal Funds Rate as shown in Table 4. Similarly, the consensus for long-term interest rates, reflected in the rate for 30-year Treasury Bonds, is also largely expected

[7]The FOMC is the monetary policymaking body of the Federal Reserve.

to remain flat to slightly declining to a level near 1.9% through the fourth quarter of 2021.

TABLE 4

Blue Chip Financial Forecasts
Projected Federal Funds Rate, 30-Year Treasury Bond Yields, and GDP Price Index

Publication Date	1Q 2020	2Q 2020	3Q 2020	4Q 2020	1Q 2021	2Q 2021	3Q 2021	4Q 2021
Federal Funds Rate								
Apr-20	1.4	0.1	0.1	0.1	0.2	0.3	0.3	
May-20	**1.3**	0.1	0.1	0.1	0.1	0.2	0.2	
Jun-20	**1.3**	0.1	0.1	0.1	0.1	0.1	0.2	
Jul-20		0.1	0.1	0.1	0.1	0.1	0.1	0.1
Aug-20		**0.1**	0.1	0.1	0.1	0.1	0.1	0.1
Sep-20		**0.1**	0.1	0.1	0.1	0.1	0.1	0.1
T-Bond, 30 yr.								
Apr-20	1.9	1.5	1.5	1.7	1.8	2.0	2.0	
May-20	**1.9**	1.3	1.4	1.5	1.6	1.7	1.8	
Jun-20	**1.9**	1.4	1.5	1.5	1.7	1.8	1.9	
Jul-20		1.4	1.5	1.6	1.7	1.8	1.8	1.9
Aug-20		**1.4**	1.4	1.5	1.6	1.7	1.8	1.9
Sep-20		**1.4**	1.4	1.5	1.6	1.6	1.7	1.8
GDP Price Index								
Apr-20	1.4	-0.1	1.2	1.5	1.8	1.9	1.8	
May-20	**1.3**	0.1	1.1	1.3	1.7	1.9	1.8	
Jun-20	**1.4**	-0.4	1.0	1.3	1.5	1.7	1.7	
Jul-20		-0.6	1.2	1.4	1.5	1.6	1.7	1.7
Aug-20		**-1.8**	1.5	1.3	1.5	1.6	1.7	1.7
Sep-20		**-2.0**	1.9	1.3	1.5	1.4	1.6	1.6

Source and Note:
Blue Chip Financial Forecasts, April 2020 through September 2020.
Actual Yields in Bold

Q WILL YOU PLEASE BRIEFLY DESCRIBE RECENT MONETARY POLICY ACTIONS TAKEN BY THE FEDERAL RESERVE?

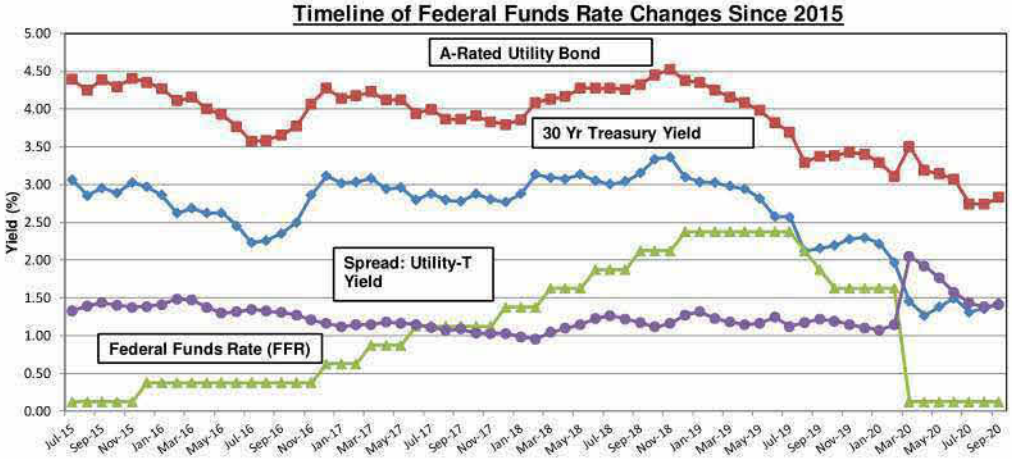
A Yes. Prior to cutting rates in August 2019, the Federal Reserve had been implementing a "normalization" of monetary policy by taking what is known as tightening actions since December 2015 when it started raising the target Federal Funds Rate. Such normalization or tightening actions included raising the Federal Funds Rate and reducing its securities holdings on its balance sheet. In August 2019, the FOMC voted to reduce the target Federal Funds Rate by 25 basis points and end the planned reduction of its securities holdings on its balance sheet. The Federal Funds Rate has been cut an additional four times through my study period.

Q PRIOR TO ITS RECENT ACTIONS, IS THERE EVIDENCE THAT THE FEDERAL RESERVE'S NORMALIZATION POLICY HAD MINIMAL IMPACT ON LONG-TERM RATES?

A Yes. Prior to lowering the short-term rate in August, the Federal Reserve had raised the Federal Funds Rate nine times since December 2015, raising the short-end of the yield curve. However, comparable increases for longer maturity bonds have not been realized. This had the effect of flattening the yield curve. This is illustrated in Figure 3.

Figure 3

Timeline of Federal Funds Rate Changes Since 2015



Fed FFR Actions:		Midpoint of FFR	Change			Midpoint of FFR	Change
1	December 2015	0.375		8	September 2018	2.125	0.25
2	December 2016	0.625	0.25	9	December 2018	2.375	0.25
3	March 2017	0.875	0.25	10	August 2019	2.125	(0.25)
4	June 2017	1.125	0.25	11	September 2019	1.875	(0.25)
5	December 2017	1.375	0.25	12	October 2019	1.625	(0.25)
6	March 2018	1.625	0.25	13	March 2020	1.125	(0.50)
7	June 2018	1.875	0.25	14	March 2020	0.125	(1.00)

Sources:
Federal Reserve Bank of New York, https://apps.newyorkfed.org/markets/autorates/fed-funds-search-page
Board of Governors of the Federal Reserve System, https://www.federalreserve.gov/datadownload/
Moody's Credit Trends, https://credittrends.moodys.com/

As shown in Figure 3, the actions taken by the Federal Reserve to increase the Federal Funds Rate have simply flattened the yield curve and did not result in a corresponding increase in long-term interest rates. This is significant because the cost of common equity is impacted by long-term interest rates, not short-term interest rates.

Q DO YOU BELIEVE THAT MARKET PARTICIPANTS AND THE CONSENSUS OF INDEPENDENT ECONOMISTS REFLECT ALL RELEVANT FACTORS IN FORMING THEIR INTEREST RATE PROJECTIONS?

A Yes. Because the Federal Reserve's actions are well followed by market participants and captured in independent economists' outlooks for changes in capital market costs, the Federal Reserve's actions, along with all other relevant factors, are considered by

economists in forming their outlooks for changes in interest rates and capital market conditions.

As such, this well-informed outlook for changes in interest rates is certainly relevant in assessing whether or not the current low-cost capital market environment is expected to prevail or change over time.

IV. RETURN ON EQUITY

Q PLEASE DESCRIBE WHAT IS MEANT BY A "UTILITY'S COST OF COMMON EQUITY."

A A utility's cost of common equity is the expected return that investors require on an investment in the utility. Investors expect to earn their required return by receiving dividends and through stock price appreciation.

Q PLEASE DESCRIBE THE FRAMEWORK FOR DETERMINING A REGULATED UTILITY'S COST OF COMMON EQUITY.

A In general, determining a fair cost of common equity for a regulated utility has been framed by two hallmark decisions of the U.S. Supreme Court: *Bluefield Water Works & Improvement Co. v. Pub. Serv. Comm'n of W. Va.*, 262 U.S. 679 (1923) and *Fed. Power Comm'n v. Hope Natural Gas Co.*, 320 U.S. 591 (1944).

These decisions identify the general financial and economic standards to be considered in establishing the cost of common equity for a public utility. Those general standards provide that the authorized return should: (1) be sufficient to maintain financial integrity; (2) attract capital under reasonable terms; and (3) be commensurate with returns investors could earn by investing in other enterprises of comparable risk.

Q PLEASE DESCRIBE THE METHODS YOU HAVE USED TO ESTIMATE APS'S COST OF COMMON EQUITY.

A I have used several models based on financial theory to estimate APS's cost of common equity. These models are: (1) a constant growth Discounted Cash Flow ("DCF") model using the consensus of analysts' growth rate projections; (2) a constant growth DCF using sustainable growth rate estimates; (3) a multi-stage DCF model; (4) a Risk Premium model; and (5) a Capital Asset Pricing Model ("CAPM"). I have applied these models to a group of publicly traded utilities with investment risk similar to APS.

IV.A. APS's Investment Risk

Q PLEASE DESCRIBE THE MARKET'S ASSESSMENT OF THE INVESTMENT RISK OF APS.

A The market's assessment of APS's investment risk is described by credit rating analysts' reports. APS's current ratings from S&P and Moody's are A- and A2, respectively.[8] The Company's outlook from S&P is "Stable" and "Negative" from Moody's.

S&P describes APS's "Stable" credit outlook as follows:

> **Outlook: Stable**
>
> The stable outlook reflects S&P Global Ratings' view that parent company Pinnacle West Capital Corp. (PWCC) will continue to effectively manage regulatory risk through its wholly owned subsidiary, APSC, while maintaining FFO to debt of approximately 18%-20%.
>
> * * *
>
> **Business Risk: Excellent**
>
> Our assessment of APSC's business risk profile reflects our view of the company's relatively lower-risk, vertically integrated regulated electric

[8]Bulkley Direct at 31.

> utility, and the company's effective management of regulatory risk despite our view that Arizona's regulation have been historically challenging. The Arizona Corporate Commissioners are all elected and at times have acted in a manner that is less credit supportive. APSC effectively manages regulatory risk by filing rate cases and using riders, which we assess as credit supportive. Some of the company's riders include a power supply adjustor for fuel and purchase power, a system benefit charge, a transmission adjustor, and a lost fixed cost recovery rider.
>
> * * *
>
> **Financial Risk: Significant**
>
> We assess APSC's financial risk profile using our medial volatility financial benchmarks, to reflect the company's lower-risk regulated utility operations that includes the higher operating risk of the company's regulated generation and effective management of regulatory risk.[9]

On January 22, 2020, Moody's revised its outlook for APS to "negative" from "stable" for two primary reasons. In its announced rating action, Moody's stated the following:

> **RATINGS RATIONALE**
>
> "The rating action follows APS's announcement of a new clean energy plan which, although positive from an environmental perspective, will likely result in an increase in near-term leverage and a further decline in cash flow-based credit metrics," said Laura Schumacher, Vice President -- Senior Credit Officer. "In addition, the plan is being undertaken at a time when APS is under increased scrutiny from its regulator, the Arizona Corporation Commission (ACC), which adds uncertainty to the utility's ability to recover its investments on a timely basis" added Schumacher.
>
> * * *
>
> APS' regulatory relationship has recently become challenged due to a number of issues including the utility's implementation of new rate plans in 2018, its disconnection policies during times of excessive heat in 2019, its provision of a faulty rate comparison tool to customers, and the level of campaign contributions made by its parent, Pinnacle. These issues have stressed the company's relationship with the ACC and caused the regulator to order an investigation into APS's earnings and customer outreach efforts and to require a new rate case in 2019. APS filed the rate case on October 31, 2019, requesting a $184 million (5.4%) revenue increase to be effective December 1, 2020.

[9] *Standard & Poor's RatingsDirect:* "Arizona Public Service Co.," May 8, 2020 at 3-5.

> The ACC also required APS to answer questions regarding its disconnection policies, its rate comparison tool and Pinnacle's campaign contributions. As a result, the company voluntarily suspended disconnections in mid-June, and adhered to an ACC enacted moratorium on disconnections from June through October. APS also initiated refunds and additional payments to customers whose use of the rate comparison tool erroneously led them to choose a higher cost rate plan. Most recently, Pinnacle committed that it would not participate in any elections of ACC commissioners. It is not clear how effective APS and Pinnacle's responses to these issues will be in restoring their regulatory relationship; the ACC's decision in the APS pending rate case will likely provide an important indication.[10]

Q DO YOU HAVE ANY CONCERNS GIVEN APS'S "NEGATIVE" OUTLOOK FROM MOODY'S?

A Yes. Much of Moody's rationale regarding its revised outlook for APS are not based on a fundamental degradation of the Company's cash flow credit metrics. Rather, much of the concern expressed by Moody's is the potential decline in the relationship APS has with the ACC because of certain actions taken by APS and its parent company, Pinnacle West. Should APS's ratings at Moody's be further impacted by negative actions made by APS, or its parent, customers should be held harmless.

IV.B. APS's Proposed Capital Structure

Q WHAT CAPITAL STRUCTURE IS APS REQUESTING IN THIS CASE?

A APS's proposed capital structure is shown in Table 5:

[10] *Moody's Investors Service*, "Rating Action: Moody's affirms ratings of Arizona Public Service and Pinnacle West, revises outlooks to negative", January 22, 2020.

TABLE 5

APS's Proposed Capital Structure

Description	Weight
Long-Term Debt	45.33%
Common Equity	54.67%
Total Permanent Capital Structure	100.00%

Source: Schedule D-1.

Q HOW DOES APS'S REQUESTED CAPITAL STRUCTURE COMPARE TO WHAT HAS BEEN AUTHORIZED FOR OTHER ELECTRIC UTILITIES RECENTLY?

A APS's requested common equity ratio of 54.67% is significantly higher than the average and median common equity ratio of 50.46% and 50.52%, respectively, that was awarded to regulated electric utilities in the first half of 2020 as identified in Table 5 above.

Q ARE YOU PROPOSING AN ADJUSTMENT TO APS'S CAPITAL STRUCTURE?

A Not at this time. However, given its significantly elevated level of common equity relative to what has been authorized for other electric utilities as discussed above, and relative to the proxy group, which I discuss below, an ROE in the lower half of my range could be warranted.

IV.C. Risk Proxy Group

Q PLEASE DESCRIBE HOW YOU IDENTIFIED A PROXY GROUP THAT COULD BE USED TO ESTIMATE APS'S CURRENT MARKET COST OF EQUITY.

A To limit the issues surrounding a fair ROE, I have relied on the same proxy group developed by APS witness Ms. Bulkley.

Q PLEASE DESCRIBE HOW YOUR PROXY GROUP'S INVESTMENT RISK COMPARES TO APS.

A The proxy group shown in Attachment CCW-3DR has an average corporate credit rating from S&P of BBB+, which is one notch below APS's rating of A-. The proxy group has an average corporate credit rating from Moody's of Baa2, which is three notches below APS's credit rating from Moody's of A2. Based on these credit ratings parameters, I conclude that APS is less risky than the proxy group.

As also shown on my Attachment CCW-3DR, the proxy group has an average and median common equity ratio (including short-term debt) as reported by S&P Global Market Intelligence ("MI") of 41.7% and 40.1%, respectively. Similarly, as reported by *The Value Line Investment Survey* ("*Value Line*"), the proxy group has an average and median common equity ratio (excluding short-term debt) of 45.4% and 44%, respectively. In this regard, the Company's proposed common equity ratio of 54.7% excluding short-term debt is higher than the average and median common equity ratios of the proxy group. As I stated above, given the substantial discrepancy in APS's common equity ratio relative to the industry generally, and the proxy group specifically, an ROE in the lower half of my range could be warranted should the Commission adopt APS's common equity ratio.

IV.D. Discounted Cash Flow Model

Q PLEASE DESCRIBE THE DCF MODEL.

A The DCF model posits that a stock price equals the sum of the present value of expected future cash flows discounted at the investor's required rate of return or cost of capital. This model is expressed mathematically as follows:

$$P_0 = \frac{D_1}{(1+K)^1} + \frac{D_2}{(1+K)^2} \ldots . \frac{D_\infty}{(1+K)^\infty} \qquad \text{(Equation 1)}$$

P_0 = Current stock price
D = Dividends in periods 1 - ∞
K = Investor's required return

This model can be rearranged in order to estimate the discount rate or investor-required return, known as "K." If it is reasonable to assume that earnings and dividends will grow at a constant rate, then Equation 1 can be rearranged as follows:

$$K = D_1/P_0 + G \qquad \text{(Equation 2)}$$

K = Investor's required return
D_1 = Dividend in first year
P_0 = Current stock price
G = Expected constant dividend growth rate

Equation 2 is referred to as the annual "constant growth" DCF model.

Q PLEASE DESCRIBE THE INPUTS TO YOUR CONSTANT GROWTH DCF MODEL.

A As shown in Equation 2 above, the DCF model requires a current stock price, expected dividend, and expected growth rate in dividends.

Q WHAT STOCK PRICE HAVE YOU RELIED ON IN YOUR CONSTANT GROWTH DCF MODEL?

A I relied on the average of the weekly high and low stock prices of the utilities in the proxy group over a 13-week and 26-week period ending on September 18, 2020. An

average stock price is less susceptible to market price variations than a price at a single point in time. Therefore, an average stock price is less susceptible to aberrant market price movements, which may not reflect the stock's long-term value.

Q WHAT DIVIDEND DID YOU USE IN YOUR CONSTANT GROWTH DCF MODEL?

A I used the most recently paid quarterly dividend as reported in *Value Line*.[11] This dividend was annualized (multiplied by 4) and adjusted for next year's growth to produce the D_1 factor for use in Equation 2 above. In other words, I calculate D_1 by multiplying the annualized dividend (D_0) by (1+G).

Q WHAT DIVIDEND GROWTH RATES HAVE YOU USED IN YOUR CONSTANT GROWTH DCF MODEL?

A There are several methods that can be used to estimate the expected growth in dividends. However, regardless of the method, for purposes of determining the market-required return on common equity, one must attempt to estimate investors' expectations about what the dividend, or earnings growth rate will be and not what an individual investor or analyst may use to make individual investment decisions.

As predictors of future returns, securities analysts' growth estimates have been shown to be more accurate than growth rates derived from historical data.[12] That is, assuming the market generally makes rational investment decisions, analysts' growth projections are more likely to influence investors' decisions, which are captured in observable stock prices, than growth rates derived only from historical data.

[11] *The Value Line Investment Survey*, July 24, August 14, and September 11, 2020.

[12] *See, e.g.*, David Gordon, Myron Gordon, and Lawrence Gould, "Choice Among Methods of Estimating Share Yield," *The Journal of Portfolio Management*, Spring 1989.

For my constant growth DCF analysis, I have relied on a consensus, or mean, of professional securities analysts' earnings growth estimates as a proxy for investors' dividend growth rate expectations. I used the average of analysts' growth rate estimates from three sources: Zacks, MI, and Yahoo! Finance. All such projections were available on September 18, 2020, and all were reported online.

Each growth rate projection is based on a survey of independent securities analysts. There is no clear evidence whether a particular analyst is most influential on general market investors. Therefore, a single analyst's projection does not as reliably predict investor outlooks as does a consensus of market analysts' projections. The consensus of estimates is a simple arithmetic average, or mean, of surveyed analysts' earnings growth forecasts. A simple average of the growth forecasts gives equal weight to all surveyed analysts' projections. Therefore, a simple average, or arithmetic mean, of analyst forecasts is a good proxy for investor expectations.

The growth rates I used in my DCF analysis are shown in Attachment CCW-4DR. The average growth rate for my proxy group is 5.27%, while the median growth rate is 5.71%.

Q WHAT ARE THE RESULTS OF YOUR CONSTANT GROWTH DCF MODEL?

A As shown in Attachment CCW-5DR, the average and median constant growth DCF returns for my proxy group for the 13-week analysis are 9.50% and 9.35%, respectively. The average and median constant growth DCF returns for my proxy group for the 26-week analysis are 9.47% and 9.31%, respectively.

Q DO YOU HAVE ANY COMMENTS ON THE RESULTS OF YOUR CONSTANT GROWTH DCF ANALYSIS?

A Yes. The constant growth DCF analysis for my proxy group is based on a group average long-term sustainable growth rate of 5.27%. The three- to five-year growth rates are higher than the long-term projected GDP growth rate of 4.24%, described below.

Q HOW DID YOU IDENTIFY THE LONG-TERM PROJECTED GDP GROWTH RATE?

A *Blue Chip Financial Forecasts,* which is a well-respected and often-cited publication, projects that over the next 5 and 10 years, the U.S. nominal GDP will grow at an annual rate of approximately 4.2%. These GDP growth projections reflect two components: (1) a real growth outlook of around 2.2%; and (2) an inflation outlook of around 2.0% going forward. As such, the average growth rate over the next 10 years is around 4.2%, which I believe is a reasonable proxy of long-term sustainable growth.[13]

In my multi-stage DCF analysis, I discuss academic and investment practitioner support for using the projected long-term GDP growth outlook as a maximum sustainable growth rate projection. A long-term sustainable growth rate for a utility stock cannot exceed the growth rate of the economy in which it sells its goods and services. Therefore, using the long-term GDP growth rate as a conservative projection for the maximum sustainable growth rate is logical, and is generally consistent with economic theory and practice.

[13] *Blue Chip Financial Indicators,* June 1, 2020, at 14.

IV.E. Sustainable Growth DCF

Q PLEASE DESCRIBE WHAT THE SUSTAINABLE GROWTH DCF METHOD IS AND HOW YOU ESTIMATED A SUSTAINABLE GROWTH RATE FOR YOUR SUSTAINABLE GROWTH DCF MODEL.

A A sustainable growth rate, also known as the internal growth rate, is based on the percentage of the utility's earnings that is retained and reinvested in utility plant and equipment. These reinvested earnings increase the earnings base (rate base). Earnings grow when plant funded by reinvested earnings is put into service, and the utility is allowed to earn its authorized return on such additional rate base investment.

The internal growth methodology is tied to the percentage of earnings retained in the Company and not paid out as dividends. The earnings retention ratio is 1 minus the dividend payout ratio. As the payout ratio declines, the earnings retention ratio increases. An increased earnings retention ratio will fuel stronger growth because the business funds more investments with retained earnings.

The payout ratios of the proxy group are shown in my Attachment CCW-6DR. These dividend payout ratios and earnings retention ratios then can be used to develop a sustainable long-term earnings retention growth rate. A sustainable long-term earnings retention ratio will help gauge whether analysts' current three- to five-year growth rate projections can be sustained over an indefinite period of time.

The data used to estimate the long-term sustainable growth rate is based on the Company's current market-to-book ratio and on *Value Line*'s three- to five-year projections of earnings, dividends, earned returns on book equity, and stock issuances.

As shown in Attachment CCW-7DR, based on my 13-week average stock price, the average sustainable growth rate for the proxy group using this internal growth rate

model is 4.97%. Based on my 26-week average stock price, the average sustainable growth rate for the proxy group using this internal growth rate model is 4.98%.

Q WHAT IS THE DCF ESTIMATE USING THESE SUSTAINABLE GROWTH RATES?

A A DCF estimate based on these sustainable growth rates is developed in Attachment CCW-8DR. As shown there, and using the same formula in Equation 2 above, a sustainable growth DCF analysis produces proxy group average and median DCF results for the 13-week period of 9.18% and 8.82%, respectively. The average and median DCF results for the 26-week period are 9.17% and 8.74%, respectively.

IV.F. Multi-Stage DCF Model

Q HAVE YOU CONDUCTED ANY OTHER DCF STUDIES?

A Yes. As previously indicated, the DCF is designed to reflect a present value of an infinite string of future cash flow. That said, however, my first constant growth DCF is based on the analyst growth rate projections, so it is a reasonable reflection of rational investment expectations over the next three- to five- years. The limitation on this constant growth DCF model is that it cannot reflect a rational expectation that a period of high or low short-term growth can be followed by a change in growth to a rate that is more reflective of long-term sustainable growth. In order to account for the outlook of changing growth expectations, I performed a multi-stage DCF analysis.

Q WHY DO YOU BELIEVE GROWTH RATES CAN CHANGE OVER TIME?

A Analyst-projected growth rates over the next three to five years will change as utility earnings growth outlooks change. Utility Companies go through cycles in making investments in their systems. When utility Companies are making large investments,

their rate base grows rapidly, which in turn accelerates earnings growth. Once a major construction cycle is completed or levels off, growth in the utility rate base slows and its earnings growth slows from an abnormally high three- to five-year rate to a lower sustainable growth rate.

As major construction cycles extend over longer periods of time, even with an accelerated construction program, the growth rate of the utility will slow simply because rate base growth will slow and the utility has limited human and capital resources available to expand its construction program. Therefore, the three- to five-year growth rate projection should be used as a long-term sustainable growth rate, but not without making a reasonable informed judgment to determine whether it considers the current market environment, the industry, and whether the three- to five-year growth outlook is sustainable.

Q PLEASE DESCRIBE YOUR MULTI-STAGE DCF MODEL.

A The multi-stage DCF model reflects the possibility of non-constant growth for a Company over time. The multi-stage DCF model reflects three growth periods: (1) a short-term growth period consisting of the first five years; (2) a transition period, consisting of the next five years (6 through 10); and (3) a long-term growth period starting in year 11 and extending into perpetuity.

For the short-term growth period, I relied on the consensus of analysts' growth projections described above in relationship to my constant growth DCF model. For the transition period, the growth rates were reduced or increased by an equal factor reflecting the difference between the analysts' growth rates and the long-term sustainable growth rate. For the long-term growth period, I assumed each Company's growth would converge to the maximum sustainable long-term growth rate.

Q WHY IS THE GDP GROWTH PROJECTION A REASONABLE PROXY FOR THE MAXIMUM SUSTAINABLE LONG-TERM GROWTH RATE?

A Utilities cannot indefinitely sustain a growth rate that exceeds the growth rate of the economy in which they sell services. Utilities' earnings/dividend growth is created by increased utility investment or rate base. Such investment, in turn, is driven by service area economic growth and demand for utility service. In other words, utilities invest in plant to meet sales demand growth. Sales growth, in turn, is tied to economic growth in their service areas.

The U.S. Department of Energy, Energy Information Administration ("EIA") has observed that utility sales growth tracks U.S. GDP growth, albeit at a lower level, as shown in Attachment CCW-9DR. Utility sales growth has lagged behind GDP growth for more than a decade. As a result, nominal GDP growth is a very conservative proxy for utility sales growth, rate base growth, and earnings growth. Therefore, the U.S. GDP nominal growth rate is a conservative proxy for the highest sustainable long-term growth rate of a utility.

Q IS THERE RESEARCH THAT SUPPORTS YOUR POSITION THAT, OVER THE LONG TERM, A COMPANY'S EARNINGS AND DIVIDENDS CANNOT GROW AT A RATE GREATER THAN THE GROWTH OF THE U.S. GDP?

A Yes. This concept is supported in published analyst literature and academic work. Specifically, in a textbook titled "Fundamentals of Financial Management," published by Eugene Brigham and Joel F. Houston, the authors state as follows:

> The constant growth model is most appropriate for mature Companies with a stable history of growth and stable future expectations. Expected growth rates vary somewhat among Companies, but dividends for

> mature firms are often expected to grow in the future at about the same rate as nominal gross domestic product (real GDP plus inflation).[14]

The use of the economic growth rate is also supported by investment practitioners as outlined as follows:

> **Estimating Growth Rates**
>
> One of the advantages of a three-stage discounted cash flow model is that it fits with life cycle theories in regards to Company growth. In these theories, Companies are assumed to have a life cycle with varying growth characteristics. Typically, the potential for extraordinary growth in the near term eases over time and eventually growth slows to a more stable level.
>
> * * *
>
> Another approach to estimating long-term growth rates is to focus on estimating the overall economic growth rate. Again, this is the approach used in the *Ibbotson Cost of Capital Yearbook*. To obtain the economic growth rate, a forecast is made of the growth rate's component parts. Expected growth can be broken into two main parts: expected inflation and expected real growth. By analyzing these components separately, it is easier to see the factors that drive growth.[15]

Q ARE THERE ANY ACTUAL INVESTMENT RESULTS THAT SUPPORT THE NOTION THAT THE GROWTH IN STOCK INVESTMENTS WILL NOT EXCEED THE NOMINAL GROWTH OF THE U.S. GDP?

A Yes. This is evident by a comparison of the compound annual growth of the U.S. GDP compared to the geometric growth of the U.S. stock market. Duff & Phelps measures the historical geometric growth of the U.S. stock market over the period 1926-2019 to be approximately 6.1%.[16] During this same time period, the U.S. nominal compound annual growth of the U.S. GDP was approximately 6.1%.[17]

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[14] *"Fundamentals of Financial Management,"* Eugene F. Brigham and Joel F. Houston, Eleventh Edition 2007, Thomson South-Western, a Division of Thomson Corporation at 298 (emphasis added).
[15] *Morningstar, Inc., Ibbotson SBBI 2013 Valuation Yearbook* at 51 and 52.
[16] *Duff & Phelps, 2020 SBBI Yearbook* at 6-17.
[17] U.S. Bureau of Economic Analysis, July 27, 2020.

As such, over the past 90 years, the geometric average growth of the U.S. nominal GDP has been higher but comparable to the average geometric growth of the U.S. stock market capital appreciation. This historical relationship indicates that the U.S. GDP growth outlook is a conservative estimate of the long-term sustainable growth of U.S. stock investments.

Q WHAT IS THE GEOMETRIC AVERAGE AND WHY IS IT APPROPRIATE TO USE THIS MEASURE TO COMPARE GDP GROWTH TO CAPITAL APPRECIATION IN THE STOCK MARKET?

A The geometric average growth rate and compound annual growth rate are used interchangeably. The geometric annual growth rate is the calculated growth rate, or return, that measures the magnitude of growth from start to finish. The geometric average is best, and most often, used as a measurement of performance or growth over a long period of time.[18] Because I am comparing achieved growth in the stock market to achieved growth in U.S. GDP over a long period of time, the geometric average growth rate is most appropriate.

Q HOW DID YOU DETERMINE A LONG-TERM GROWTH RATE THAT REFLECTS THE CURRENT CONSENSUS OF INDEPENDENT MARKET PARTICIPANTS?

A I relied on the consensus of long-term GDP growth projections as projected by independent economists. *Blue Chip Financial Forecasts* publishes the consensus for GDP growth projections twice a year. These projections reflect current outlooks for GDP and are likely to be influential on investors' expectations of future growth outlooks. The consensus of projected GDP growth is about 4.20% over the next 10 years.[19]

[18] *New Regulatory Finance*, Roger Morin, PhD, at 133-134.
[19] *Blue Chip Financial Forecasts*, June 1, 2020, at 14.

Q DO YOU CONSIDER OTHER SOURCES OF PROJECTED LONG-TERM GDP GROWTH?

A Yes, and the consistency of the projections from these sources corroborate my use of the consensus projections, as shown in Table 6.

TABLE 6

GDP Forecasts

Source	Real GDP	Inflation	Nominal GDP
Blue Chip Financial Forecasts	2.3%	2.0%	4.2%
EIA - Annual Energy Outlook	1.8%	2.2%	4.1%
Congressional Budget Office	1.9%	2.0%	3.9%
Moody's Analytics	2.2%	1.8%	4.1%
Social Security Administration			4.1%
The Economist Intelligence Unit	1.8%	1.7%	3.5%

The EIA in its *Annual Energy Outlook* projects real GDP out until 2050. In its 2020 Annual Report, the EIA projects real GDP through 2050 to be 1.8% and a long-term GDP price inflation projection of 2.2%. The EIA data supports a long-term nominal GDP growth outlook of 4.1%.[20]

Also, the Congressional Budget Office ("CBO") makes long-term economic projections. The CBO is projecting real GDP growth to be 1.9% with a GDP price inflation outlook of 2.0%. The CBO's outlook for nominal GDP based on this projection is 3.9% through 2029.[21]

Moody's Analytics also makes long-term economic projections. In its recent forecast through 2050, Moody's Analytics is projecting real GDP growth of 2.2% with

[20] DOE/EIA Annual Energy Outlook 2020 With Projections to 2050, January 2020, Table 20.
[21] *CBO: An Update to the Economic Outlook: 2019 to 2029*, August 2019.

GDP inflation of 1.8%.[22] Based on these projections, Moody's is projecting nominal GDP growth of 4.1% through 2050.

The Social Security Administration ("SSA") makes long-term economic projections out to 2095. The SSA's nominal GDP projection, under its "intermediate cost" scenario of approximately 75 years, is 4.1%.[23]

The Economist Intelligence Unit, a division of *The Economist* and a third-party data provider to MI, makes a long-term economic projection out through 2050. The Economist Intelligence Unit is projecting real GDP growth of 1.8% with an inflation rate of 1.7% through 2050. The real GDP growth projection is in line with the consensus. The long-term nominal GDP projection based on these outlooks is approximately 3.5%.[24]

The real GDP and nominal GDP growth projections made by these independent sources support the use of the consensus for 5-year and 10-year projected GDP growth outlooks as a reasonable estimate of market participants' long-term GDP growth.

Q WHAT STOCK PRICE, DIVIDEND, AND GROWTH RATES DID YOU USE IN YOUR MULTI-STAGE DCF ANALYSIS?

A I relied on the same 13-week and 26-week average stock prices and the most recent quarterly dividend payment data discussed above. For the first stage, I used the consensus of analysts' growth rate projections discussed above in my constant growth DCF model. The first stage covers the first five years, consistent with the time horizon of the securities analysts' growth rate projections. The second stage, or transition stage, begins in year 6 and extends through year 10. The second stage growth

[22] www.economy.com, *Moody's Analytics Forecast*, May 11, 2020.
[23] www.ssa.gov, "2020 OASDI Trustees Report," April 22, 2020.
[24] *S&P Global Market Intelligence, Economist Intelligence Unit*, downloaded on March 10, 2020.

transitions the growth rate from the first stage to the third stage using a straight linear trend. For the third stage, or long-term sustainable growth stage, starting in year 11, I used a 4.24% long-term sustainable growth rate based on the consensus of economists' long-term projected nominal GDP growth rate.

Q WHAT ARE THE RESULTS OF YOUR MULTI-STAGE DCF MODEL?

A As shown in Attachment CCW-10DR, the average and median DCF ROEs for my proxy group using the 13-week average stock price are 8.67% and 8.78%, respectively. The average and median DCF ROEs for my proxy group using the 26-week average stock price are 8.64% and 8.77%, respectively.

Q PLEASE SUMMARIZE THE RESULTS FROM YOUR DCF ANALYSES.

A The DCF results are summarized in Table 7 below. It is my opinion a reasonable ROE based on the DCF results summarized in Table 7 is 9.1%.

TABLE 7

Summary of DCF Results

Description	Proxy Group Average	Proxy Group Median
13-wk Constant Growth DCF Model (Analysts' Growth)	9.50%	9.35%
26-wk Constant Growth DCF Model (Analysts' Growth)	9.47%	9.31%
13-wk Constant Growth DCF Model (Sustainable Growth)	9.18%	8.82%
26-wk Constant Growth DCF Model (Sustainable Growth)	9.17%	8.74%
13-wk Multi-Stage DCF Model	8.67%	8.78%
26-wk Multi-Stage DCF Model	8.64%	8.77%

IV.G. Risk Premium Model

Q PLEASE DESCRIBE YOUR BOND YIELD PLUS RISK PREMIUM MODEL.

A This model is based on the principle that investors require a higher return to assume greater risk. Common equity investments have greater risk than bonds because bonds have more security of payment in bankruptcy proceedings than common equity and the coupon payments on bonds represent contractual obligations. In contrast, Companies are not required to pay dividends or guarantee returns on common equity investments. Therefore, common equity securities are considered to be riskier than bond securities.

This risk premium model is based on two estimates of an equity risk premium. First, I quantify the difference between regulatory commission-authorized returns on common equity and contemporary U.S. Treasury bonds. The difference between the authorized return on common equity and the Treasury bond yield is the risk premium. I estimated the risk premium on an annual basis for each year since January 1986. The authorized ROEs were based on regulatory commission-authorized returns for electric utility Companies. Authorized returns are typically based on expert witnesses' estimates of the investor-required return at the time of the proceeding.

The second equity risk premium estimate is based on the difference between regulatory commission-authorized returns on common equity and contemporary "A" rated utility bond yields by Moody's. I selected the period 1986 through June 2020 because public utility stocks consistently traded at a premium to book value during that period. This is illustrated in Attachment CCW-11DR, which shows the market-to-book ratio since 1986 for the electric utility industry was consistently above a multiple of 1.0x. Over this period, an analyst can infer that authorized ROEs were sufficient to support market prices that at least exceeded book value. This is an indication that commission authorized returns on common equity supported a utility's ability to issue additional

common stock without diluting existing shares. It further demonstrates that utilities were able to access equity markets without a detrimental impact on current shareholders.

Based on this analysis, as shown in Attachment CCW-12DR the average indicated equity risk premium over U.S. Treasury bond yields has been 5.65%. Since the risk premium can vary depending upon market conditions and changing investor risk perceptions, I believe using an estimated range of risk premiums provides the best method to measure the current return on common equity for a risk premium methodology.

I incorporated five-year and 10-year rolling average risk premiums over the study period to gauge the variability over time of risk premiums. These rolling average risk premiums mitigate the impact of anomalous market conditions and skewed risk premiums over an entire business cycle. As shown on my Attachment CCW-12DR, the five-year rolling average risk premium over Treasury bonds ranged from 4.25% to 7.02%, while the 10-year rolling average risk premium ranged from 4.38% to 6.80%.

As shown on my Attachment CCW-13DR, the average indicated equity risk premium over contemporary "A" rated Moody's utility bond yields was 4.28%. The five-year and 10-year rolling average risk premiums ranged from 2.88% to 5.74% and 3.20% to 5.60%, respectively.

Q DO YOU BELIEVE THAT THE TIME PERIOD USED TO DERIVE THESE EQUITY RISK PREMIUM ESTIMATES IS APPROPRIATE TO FORM ACCURATE CONCLUSIONS ABOUT CONTEMPORARY MARKET CONDITIONS?

A Yes. Contemporary market conditions can change dramatically during the period that rates determined in this proceeding will be in effect. A relatively long period of time

where stock valuations reflect premiums to book value indicates that the authorized ROEs and the corresponding equity risk premiums were supportive of investors' return expectations and provided utilities access to the equity markets under reasonable terms and conditions. Further, this time period is long enough to smooth abnormal market movement that might distort equity risk premiums. While market conditions and risk premiums do vary over time, this historical time period is a reasonable period to estimate contemporary risk premiums.

Alternatively, some studies, such as Duff & Phelps referred to later in this testimony, have recommended that use of "actual achieved investment return data" in a risk premium study should be based on long historical time periods. The studies find that achieved returns over short time periods may not reflect investors' expected returns due to unexpected and abnormal stock price performance. Short-term, abnormal actual returns would be smoothed over time and the achieved actual investment returns over long time periods would approximate investors' expected returns. Therefore, it is reasonable to assume that averages of annual achieved returns over long time periods will generally converge on the investors' expected returns.

My risk premium study is based on data that inherently relied on investor expectations, not actual investment returns, and, thus, need not encompass a very long historical time period.

Q PLEASE EXPLAIN OTHER MARKET EVIDENCE YOU RELIED ON IN DETERMINING AN APPROPRIATE EQUITY RISK PREMIUM.

A The equity risk premium should reflect the market's perception of risk in the utility industry today. I have gauged investor perceptions in utility risk today in Attachment CCW-14DR, where I show the yield spread between utility bonds and Treasury bonds

over the last 40 years. As shown in this schedule, the average utility bond yield spreads over Treasury bonds for "A" and "Baa" rated utility bonds for this historical period are 1.50% and 1.93%, respectively. Yield spreads of "A" and "Baa" rated utility bonds over Treasury bonds during 2018 were 1.14% and 1.56%, respectively, which are lower than the 40-year averages. The yield spreads of "A" and "Baa" rated utility bonds over Treasury bonds during 2019 were 1.18% and 1.61%, respectively. Similarly, the "A" and "Baa" utility spreads through June 2020 are 1.66% and 2.10%, respectively.

A current 13-week average "A" rated utility bond yield of 2.79% when compared to the current Treasury bond yield of 1.37%, as shown in Attachment CCW-15DR, page 1, implies a yield spread of 1.42%. This current utility bond yield spread is lower than the 40-year average spread for "A" rated utility bonds of 1.50%. The current spread for the "Baa" rated utility bond yield of 1.76% is also lower than the 40-year average of 1.93%.

The 26-week average "A" rated utility bond yield of 3.00% when compared to the 26-week average Treasury bond yield of 1.36%, as shown in Attachment CCW-15DR, page 2, implies a yield spread of 1.64%. This utility bond yield spread is slightly higher than the 40-year average spread for "A" rated utility bonds of 1.50%. The spread for the 26-week average "Baa" rated utility bond yield of 2.06% is also slightly higher than the 40-year average of 1.93%.

The 13-week averages are lower than the long-term averages, but the 26-week average yield spreads are higher than the long-term averages. This indicates that the market reflected a higher demand for Treasury securities during the 26-week period as a result of investors reallocating capital during the global pandemic caused by COVID-19. The average yield spreads observed during the 26-week period are being heavily influenced by the period late March through early April as utility bond yields

spiked over 4.0%. It should be noted that the 13-week and 26-week yield spreads have not reached the high levels experienced during other periods of economic recessions such as the early 1980's, early 2000's, and most recently 2008-2009. Importantly, the current 13-week yield spreads are more in line with the long-term averages.

Q WHAT IS YOUR RECOMMENDED RETURN FOR APS BASED ON YOUR RISK PREMIUM STUDY?

A Because of today's low interest rates and uncertainty revolving around forecasted interest rates, I am recommending more weight be given to the high-end risk premium estimates than the low-end, in order to be conservative. As such, I am recommending that the most recent five-year average risk premium be used in determining a fair ROE for APS. As shown on my Attachment CCW-12DR, the most recent five-year average risk premium over Treasury yields is 7.02%. A risk premium of 7.02% exceeds the 35-year average of 5.65% by 1.38%. Adding the 7.02% risk premium to the projected Treasury yield of 1.8% produces a ROE of 8.8%.

Similarly, as shown on my Attachment CCW-13DR, the most recent five-year allowed risk premium over utility bond yields is 5.74%. This risk premium is well above the 35-year historical average risk premium of 4.28%. The A-rated utility bond yield has averaged 2.79% and 3.00% over the 13-week and 26-week periods ending September 18, 2020, respectively. Adding the 5.74% risk premium to the A-rated utility bond yields of 2.79% and 3.00% produce an estimated cost of equity of 8.7%. Similarly, the Baa-rated utility bond yield has averaged 3.13% and 3.42% over the same 13-week and 26-week periods, respectively. Adding the 5.74% risk premium to the average Baa-rated utility bond yields of 3.13% and 3.42% produces an estimated cost of equity of approximately 9.2%. The estimated cost of equity using the risk premium over utility

bond yields is in the range of 8.5% to 9.2%. The results of my risk premium analyses are summarized in Table 8. Based on these results, I conclude that a reasonable ROE based on my risk premium analyses is 9.0%.

TABLE 8

Summary of Risk Premium Results

Description	ROE Estimate
Projected Treasury Yield	8.8%
13-Week Average Yields	
A-Rated Utility Bond	8.5%
Baa-Rated Utility Bond	8.9%
26-Week Average Yields	
A-Rated Utility Bond	8.7%
Baa-Rated Utility Bond	9.2%

IV.H. Capital Asset Pricing Model ("CAPM")

Q PLEASE DESCRIBE THE CAPM.

A The CAPM method of analysis is based upon the theory that the market-required rate of return for a security is equal to the risk-free rate, plus a risk premium associated with the specific security. This relationship between risk and return can be expressed mathematically as follows:

$R_i = R_f + B_i \times (R_m - R_f)$ where:

R_i = Required return for stock i
R_f = Risk-free rate
R_m = Expected return for the market portfolio
B_i = Beta - Measure of the risk for stock

The stock-specific risk term in the above equation is beta. Beta represents the investment risk that cannot be diversified away when the security is held in a diversified portfolio. When stocks are held in a diversified portfolio, stock-specific risks can be eliminated by balancing the portfolio with securities that react in the opposite direction to firm-specific risk factors (e.g., business cycle, competition, product mix, and production limitations).

The risks that cannot be eliminated when held in a diversified portfolio are non-diversifiable risks. Non-diversifiable risks are related to the market in general and referred to as systematic risks. Risks that can be eliminated by diversification are non-systematic risks. In a broad sense, systematic risks are market risks and non-systematic risks are business risks. The CAPM theory suggests the market will not compensate investors for assuming risks that can be diversified away. Therefore, the only risk investors will be compensated for are systematic, or non-diversifiable, risks. The beta is a measure of the systematic, or non-diversifiable risks.

Q PLEASE DESCRIBE THE INPUTS TO YOUR CAPM.

A The CAPM requires an estimate of the market risk-free rate, the Company's beta, and the market risk premium.

Q WHAT DID YOU USE AS AN ESTIMATE OF THE MARKET RISK-FREE RATE?

A As previously noted, *Blue Chip Financial Forecasts*' projected 30-year Treasury bond yield is 1.8%.[25] The current 30-year Treasury bond yield is 1.37%, as shown in Attachment CCW-15DR at page 1. Again, in an effort to provide a conservative ROE

[25] *Blue Chip Financial Forecasts*, September 1, 2020 at 2.

estimate, I used *Blue Chip Financial Forecasts*' projected 30-year Treasury bond yield of 1.8% for my CAPM analysis.

Q WHY DID YOU USE LONG-TERM TREASURY BOND YIELDS AS AN ESTIMATE OF THE RISK-FREE RATE?

A Treasury securities are backed by the full faith and credit of the United States government, so long-term Treasury bonds are considered to have negligible credit risk. Also, long-term Treasury bonds have an investment horizon similar to that of common stock. As a result, investor-anticipated long-run inflation expectations are reflected in both common stock required returns and long-term bond yields. Therefore, the nominal risk-free rate (or expected inflation rate and real risk-free rate) included in a long-term bond yield is a reasonable estimate of the nominal risk-free rate included in common stock returns.

Treasury bond yields, however, do include risk premiums related to unanticipated future inflation and interest rates. In this regard, a Treasury bond yield is not entirely risk-free. Risk premiums related to unanticipated inflation and interest rates reflect systematic market risks. Consequently, for Companies with betas less than 1.0, using the Treasury bond yield as a proxy for the risk-free rate in the CAPM analysis can produce an overstated estimate of the CAPM return.

Q WHAT BETA DID YOU USE IN YOUR ANALYSIS?

A As shown in Attachment CCW-16DR, the proxy group average and median *Value Line* beta estimates are 0.89 and 0.88, respectively. In my experience, these beta estimates are abnormally high and are unlikely to be sustained over the long-term. As such, I have also reviewed the historical average of the proxy group's *Value Line* betas. The

historical average *Value Line* beta since 2014 is 0.72 and has ranged from 0.57 to 0.84. In addition to Value Line, I have also included adjusted beta estimates as provided by Market Intelligence, a division of S&P Global. The average and median Market Intelligence betas are 0.69 and 0.68, respectively.

Q HOW DID YOU DERIVE YOUR MARKET RISK PREMIUM ESTIMATE?

A I derived three market risk premium estimates: a forward-looking estimate using a risk premium methodology and two forward-looking estimates based on the DCF methodology.

Q PLEASE DESCRIBE YOUR MARKET RISK PREMIUM ESTIMATE DERIVED USING THE RISK PREMIUM METHODOLOGY.

A The forward-looking risk premium-based estimate was derived by estimating the expected return on the market (as represented by the S&P 500) and subtracting the risk-free rate from this estimate. I estimated the expected return on the S&P 500 by adding an expected inflation rate to the long-term historical arithmetic average real return on the market. The real return on the market represents the achieved return above the rate of inflation.

Duff & Phelps' *2020 SBBI Yearbook* estimates the historical arithmetic average real market return over the period 1926 to 2019 to be 9.0%.[26] A current consensus for projected inflation, as measured by the Consumer Price Index ("CPI"), is 2.0%.[27] Using these estimates, the expected market return is 11.2%.[28] The market risk premium then

[26] *Duff & Phelps, 2020 SBBI Yearbook at 6-18.*
[27] *Blue Chip Financial Forecasts*, September 1, 2020 at 2.
[28] { [(1 + 0.090) * (1 + 0.02)] – 1 } * 100.

is the difference between the 11.2% expected market return and the projected risk-free rate of 1.8%, or 9.4%.

Q PLEASE DESCRIBE YOUR MARKET RISK PREMIUM ESTIMATES DERIVED USING THE DCF METHODOLOGY.

A I employed two versions of the constant growth DCF model to develop estimates of the market risk premium. I first employed the constant growth DCF model in the traditional sense by adding a projected 3-5 year growth rate to a projected dividend yield.

I obtained the expected growth rate of the S&P 500 Index from State Street Global Advisors ("State Street"). State Street is the creator of several exchange traded funds ("ETF") that cover a multitude of investment strategies. In general, ETFs can be expected to move up or down in value with the value of the applicable index. For example, the SPDR S&P 500 ETF (Ticker: SPY) is designed to correspond generally to the price and yield performance of the S&P 500 Index.

On its website, State Street publishes a multitude of comparative data for its SPY ETF and the S&P 500 Index, including the current dividend yield and 3-5 year earnings growth rates. As inputs to my first constant growth DCF analysis, I have relied on the published dividend yield and growth rate estimates for the S&P 500 Index as published by State Street on September 21, 2020. The published dividend yield and estimated growth for the S&P 500 as of September 21, 2020 were 1.68% and 11.51%, respectively. Using these inputs, a constant growth DCF produces an expected return on the market of 13.38%.[29] Subtracting the projected Treasury yield of 1.80% from the expected return on the market of 13.38% produces a market risk premium estimate of 11.60%.

[29]DCF = 1.68%*(1+11.51%) + 11.51% = 13.38%.

My second DCF-based market risk premium estimate was derived by estimating the expected market return using a version of the FERC's two-step DCF methodology. FERC's two-step DCF analysis is a constant growth DCF using a growth rate that is calculated by weighting the 3-5 year growth rate estimate by 80% and the projected long-term GDP growth rate by 20%. Applying 80% weight to the S&P 500 growth estimate of 11.51%, and 20% weight to the GDP growth rate estimate of 4.24% discussed above, produces a blended growth rate of 10.06%.[30]

I then used the blended growth rate of 10.06% and the current dividend yield of 1.68% to estimate the expected market return by employing the constant growth DCF. This yields an expected market return of 11.91%.[31] Subtracting the projected risk-free rate of 1.8% from this expected market return produces a market risk premium of approximately 10.10%.

Q PLEASE EXPLAIN WHY YOU EMPLOYED THE TWO-STEP DCF METHOD.

A As I discussed in detail above, the constant growth model assumes the input growth rate to be the growth rate in perpetuity. No Company, regulated or not, can grow at a higher rate than the economy in which it sells goods and services in perpetuity, which is the time period assumed in the DCF model. Because the actual earnings estimates for the underlying holdings are used to calculate a mean 3-5 year earnings growth rate estimate for the index, the individual growth rates for the underlying holdings must be taken into consideration in evaluating the reasonableness, or sustainability, of the growth rate for the index as a whole. For example, S&P 500 member Company National Oilwell Varco, Inc., (NYSE: NOV) has a consensus projected growth rate of 41.0% as reported by Yahoo! Finance. This growth rate is more than 10.0x greater

[30](11.51%*0.80) + (4.24%*0.20) = 10.06%.
[31]Two-Step DCF = 1.68%*(1+10.06%) + 10.06% = 11.91%.

than the consensus expected growth rate of 4.24% for the U.S. economy discussed earlier.

For these reasons, employing the two-step DCF based on a blended growth rate that gives some weight to projected GDP growth is reasonable.

Q HOW DO YOUR FORWARD-LOOKING ESTIMATES OF THE MARKET RISK PREMIUM COMPARE TO THE HISTORICAL REALIZED MARKET RISK PREMIUM?

A Between 1926 and 2019, the arithmetic average of the achieved total return on the S&P 500 was 12.1%[32] and the return on long-term Treasury bonds was 6.0%.[33] The indicated market risk premium is 6.1% (12.1% - 6.0% = 6.1%). Therefore, my forward-looking estimates of the market risk premium of 9.4%, 10.1%, and 11.6% exceed the historical market risk premium by 3.30% to 5.50%.

Q HOW DO YOUR EXPECTED MARKET RETURNS COMPARE TO CURRENT EXPECTATIONS OF FINANCIAL INSTITUTIONS?

A As shown in Table 9, my expected market returns of 11.18%, 11.91%, and 13.38% exceed long-term market expectations of several financial institutions.

[32] *Duff & Phelps, 2020 Yearbook at 6-17.*
[33] *Id.*

TABLE 9

Long-Term Expected Return on the Market

Source	Term	Expected Return: Large Cap Equities	Expected Return: Nominal US GDP
BlackRock Capital Management[1]	25 Years	7.48%	N/A
JP Morgan Chase[2]	10 - 15 Years	5.60%	3.84%
Vanguard[3]	10 Years	3.5% - 5.5%	N/A
Research Affiliates[4]	10 Years	2.80%	3.27%
Morningstar[5]	10 Years	4.60%	N/A

Sources:
[1]BlackRock Investment Institute, April 2020 report, downloaded 6/9/2020.
[2]JP Morgan Chase, Long-Term Capital Market Assumptions, 2020 Report.
[3]Vanguard 2020 Outlook: The New Age of Uncertainty, December 2019.
[4]Research Affiliates, Asset Allocation Interactive, downloaded 6/9/2020.
[5]Morningstar Markets Observer Q2 2020 at 12.

When compared to the expected market returns of financial institutions above, my expected market returns of 11.18%, 11.91%, and 13.38% are more than two times higher than all but two projections. For these reasons, my expected market returns, and the associated market risk premiums, should be considered high-end estimates.

Q HOW DO YOUR ESTIMATED MARKET RISK PREMIUMS COMPARE TO THAT ESTIMATED BY DUFF & PHELPS?

A The Duff & Phelps analysis indicates a market risk premium falls somewhere in the range of 6.0% to 7.15%. My forward-looking market risk premium estimates are in the

range of 9.4% to 11.6%. All of my market risk premium estimates are substantially above the historical and normalized market risk premiums recommended by Duff & Phelps.

Q HOW DOES DUFF & PHELPS MEASURE A MARKET RISK PREMIUM?

A Duff & Phelps makes several estimates of a forward-looking market risk premium based on actual achieved data from the historical period of 1926 through 2018 as well as normalized data. Using this data, Duff & Phelps estimates a market risk premium derived from the total return on large Company stocks (S&P 500), less the income return on Treasury bonds.

Duff & Phelps' range is based on several methodologies. First, Duff & Phelps estimates a market risk premium of 7.15% based on the difference between the total market return on common stocks (S&P 500) less the income return on 20-year Treasury bond investments over the 1926-2019 period.[34]

Second, Duff & Phelps used the Ibbotson & Chen supply-side model which produced a market risk premium estimate of 6.17%.[35] Duff & Phelps explains that the historical market risk premium based on the S&P 500 was influenced by an abnormal expansion of P/E ratios relative to earnings and dividend growth during the period, primarily over the last 30 years. In order to control for the volatility of extraordinary events and their impacts on P/E ratios, Duff & Phelps takes into consideration the three-year average P/E ratio as the current P/E ratio.[36] Therefore, Duff & Phelps adjusted this market risk premium estimate to normalize the growth in the P/E ratio to be more in line with the growth in dividends and earnings.

[34] *Duff & Phelps 2020 SBBI Yearbook* at 10-21.
[35] *Id.* at 10-29.
[36] *Duff & Phelps 2019 Valuation Handbook* at 3-46.

Finally, Duff & Phelps develops its own recommended equity, or market risk premium by employing an analysis that takes into consideration a wide range of economic information, multiple risk premium estimation methodologies, and the current state of the economy by observing measures such as the level of stock indices and corporate spreads as indicators of perceived risk. Based on this methodology, and utilizing a "normalized" risk-free rate of 2.5%, Duff & Phelps concludes that the current expected, or forward-looking, market risk premium is 6.0%, implying an expected return on the market of 8.5%.[37]

It should be noted that Duff & Phelps' market risk premiums are measured over a 20-year Treasury bond. Because I am relying on a projected 30-year Treasury bond yield, the results of my CAPM analysis should be considered conservative estimates for the cost of equity.

Q WHAT ARE THE RESULTS OF YOUR CAPM ANALYSIS?

A As shown in Attachment CCW-17DR, I have provided the results of nine different applications of the CAPM. The first three results presented are based on the proxy group's current average Value Line beta of 0.89, a projected risk-free rate of 1.8%, and my three market risk premium estimates of 9.4%, 10.1%, and 11.6%. The results of the CAPM based on these inputs range from 10.19% to 12.16%.

The next three results presented are based on the proxy group's historical Value Line beta of 0.72, a projected risk-free rate of 1.8%, and my three market risk premium estimates of 9.4%, 10.1%, and 11.6%. The results of the CAPM based on these inputs range from 8.53% to 10.11%.

[37]Duff & Phelps Technical Update, "Duff & Phelps Normalized Risk-Free Rate Lowered from 3.0% to 2.5% for the United States, United Kingdom and Canada," June 30, 2020.

The last three results presented are based on the proxy group's current S&P Global Market Intelligence beta of 0.69, a projected risk-free rate of 1.8%, and my three market risk premium estimates of 9.4%, 10.1%, and 11.6%. The results of the CAPM based on these inputs range from 8.31% to 9.83%. My CAPM results are summarized in Table 10.

Based on these results, I conclude that a reasonable CAPM estimate is 9.6%.

TABLE 10

CAPM Results Summary

Description	Current VL Beta	Historical VL Beta	Current S&P GMI Beta
Risk Premium Method	10.19%	8.53%	8.31%
FERC 2-Step DCF Method	10.82%	9.03%	8.79%
Constant Growth DCF Method	12.16%	10.11%	9.83%

IV.I. Return on Equity Summary

Q BASED ON THE RESULTS OF YOUR RETURN ON COMMON EQUITY ANALYSES DESCRIBED ABOVE, WHAT RETURN ON COMMON EQUITY DO YOU RECOMMEND FOR APS?

A The results of my analyses are summarized in Table 11.

TABLE 11

Return on Common Equity Summary

Description	Results
DCF	9.1%
Risk Premium	9.0%
CAPM	9.6%

Based on my analyses described above, I estimate APS's current market cost of equity to be in the reasonable range of 9.0% to 9.6% with a midpoint estimate of 9.3%.

IV.J. Financial Integrity

Q WILL YOUR RECOMMENDED OVERALL RATE OF RETURN SUPPORT AN INVESTMENT GRADE BOND RATING FOR APS?

A Yes. I have reached this conclusion by comparing the key credit rating financial ratios for APS at my proposed return on equity and APS's requested capital structure to S&P's benchmark financial ratios using S&P's new credit metric ranges.

Q PLEASE DESCRIBE THE MOST RECENT S&P FINANCIAL RATIO CREDIT METRIC METHODOLOGY.

A S&P publishes a matrix of financial ratios corresponding to its assessment of the business risk of utility Companies and related bond ratings. On May 27, 2009, S&P

expanded its matrix criteria by including additional business and financial risk categories.[38]

Based on S&P's most recent credit matrix, the business risk profile categories are "Excellent," "Strong," "Satisfactory," "Fair," "Weak," and "Vulnerable." Most utilities have a business risk profile of "Excellent" or "Strong."

The financial risk profile categories are "Minimal," "Modest," "Intermediate," "Significant," "Aggressive," and "Highly Leveraged." Most of the utilities have a financial risk profile of "Aggressive." APS has a "Strong" business risk profile and a "Significant" financial risk profile.

Q PLEASE DESCRIBE S&P'S USE OF THE FINANCIAL BENCHMARK RATIOS IN ITS CREDIT RATING REVIEW.

A S&P evaluates a utility's credit rating based on an assessment of its financial and business risks. A combination of financial and business risks equates to the overall assessment of APS's total credit risk exposure. On November 19, 2013, S&P updated its methodology. In its update, S&P published a matrix of financial ratios that defines the level of financial risk as a function of the level of business risk.

S&P publishes ranges for primary financial ratios that it uses as guidance in its credit review for utility Companies. The two core financial ratio benchmarks it relies on in its credit rating process include: (1) Debt to Earnings Before Interest, Taxes, Depreciation and Amortization ("EBITDA"); and (2) Funds From Operations ("FFO") to Total Debt.[39]

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[38]S&P updated its 2008 credit metric guidelines in 2009, and incorporated utility metric benchmarks with the general corporate rating metrics. *Standard & Poor's RatingsDirect*: "Criteria Methodology: Business Risk/Financial Risk Matrix Expanded," May 27, 2009.

[39]*Standard & Poor's RatingsDirect*: "Criteria: Corporate Methodology," November 19, 2013.

Q HOW DID YOU APPLY S&P'S FINANCIAL RATIOS TO TEST THE REASONABLENESS OF YOUR RATE OF RETURN RECOMMENDATIONS?

A I calculated each of S&P's financial ratios based on APS retail operations. S&P would normally look at total consolidated financial ratios in its credit review process. However, my investigation in this proceeding is not the same as S&P's. I am attempting to judge the reasonableness of my proposed cost of capital for rate-setting in APS's retail regulated utility operations. Hence, I am attempting to determine whether my proposed rate of return will in turn support cash flow metrics, balance sheet strength, and earnings that will support an investment grade bond rating and APS's financial integrity.

Q DID YOU INCLUDE ANY OFF-BALANCE SHEET DEBT EQUIVALENTS?

A Yes, I did. First, I reviewed the Company's response to FEA 1.13, where APS referred me to its SEC 10-K filing. I obtained the off-balance sheet debt attributed to operating leases, purchased power agreements, and post-retirement benefit obligations along with the associated interest and amortization expenses from S&P Capital IQ. I allocated the total off-balance sheet debt calculated by S&P to APS's retail regulated operations by applying a rate base allocator of 79.8% as shown on my Attachment CCW-18DR. I also included the associated interest and amortization expenses as calculated by S&P.

Q DID YOU ALSO INCLUDE THE CAPITALIZED INTEREST ASSOCIATED WITH CONSTRUCTION WORK IN-PROGRESS (CWIP) PROJECTS.

A. Yes, I did. As shown on Direct Schedule E-2 and described in response to FEA 1.12, the Company is requesting $23.3 million allowance for funds used during construction (AFUDC), which reflects interest charged on CWIP projects during the test year.

Q PLEASE DESCRIBE THE RESULTS OF THIS CREDIT METRIC ANALYSIS AS IT RELATES TO APS'S RETAIL OPERATIONS.

A. The S&P financial metric calculations for APS at a 9.3% return are developed on my Attachment CCW-18DR, page 1. The credit metrics produced below, with APS's financial risk profile from S&P of "Significant" and business risk profile of "Excellent," will be used to assess the strength of the credit metrics based on APS's retail operations in the state of Arizona.

APS's adjusted total debt ratio, based on its requested capital structure is approximately 48.5%, which is significantly lower than the industry median adjusted debt ratio of 52.4% for utilities with a A- bond rating.

Based on an equity return of 9.3%, APS will be provided an opportunity to produce a Debt to Earnings Before Interest, Taxes, Depreciation and Amortization ("EBITDA") ratio of 2.9x. This is within S&P's "Intermediate" guideline range of 2.5x to 3.5x,[40] which would support APS's credit rating based on S&P's reported business risk profile of "Excellent" for APS.

APS's retail operations FFO to total debt coverage at a 9.3% equity return is 27%, which is also within S&P's "Intermediate" metric guideline range of 23% to 35%. Again, this produces an FFO/total debt ratio that will support a ratio consistent with a A- rating with APS's "Excellent" business profile from S&P.

[40] *Id.*

Q DOES THIS FINANCIAL INTEGRITY ASSESSMENT SUPPORT YOUR RECOMMENDED OVERALL RATE OF RETURN FOR APS?

A Yes. As noted above, I believe my return on equity represents fair compensation in today's very low capital market costs, and as outlined above, my overall rate of return will provide APS an opportunity to earn credit metrics that will support its A- bond rating.

V. RESPONSE TO APS WITNESS MS. BULKLEY

Q WHAT RETURN ON COMMON EQUITY IS APS PROPOSING FOR THIS PROCEEDING?

A Ms. Bulkley recommends a return on equity based on her market-based model results that fall in the range of 10.0% to 10.50%. She concludes that APS's recommended return of 10.15% is reasonable and even a conservative cost of equity estimate.[41]

Q ARE MS. BULKLEY'S RETURN ON EQUITY ESTIMATES REASONABLE?

A No. Ms. Bulkley's estimated return on equity is overstated and should be rejected. Ms. Bulkley's analyses produce excessive results for various reasons, including the following:

1. Her constant growth DCF results are based on unsustainably high growth rates;
2. Ms. Bulkley's methodology of excluding low-end results below 7.0% is subjective and should be rejected;
3. Her projected DCF model is not based on observable market data;
4. Her CAPM is based on inflated market risk premiums;
5. Her Bond Yield Plus Risk Premium studies are based on inflated equity risk premiums; and

[41] Bulkley Direct at 3.

6. Her Expected Earnings analysis is unreasonable because it measures the book accounting return, rather than the market required return.

Q PLEASE CORRELATE YOUR RECOMMENDED RETURN ON EQUITY WITH MS. BULKLEY'S RETURN ON EQUITY ESTIMATES.

A Ms. Bulkley's return on equity estimates are summarized in Table 12 below. In the "Adjusted" Column 2, I show the results with prudent and sound adjustments to correct the flaws referenced above. With such adjustments to Ms. Bulkley's proxy group's DCF, CAPM, and Risk Premium return estimates, Ms. Bulkley's studies show that my 9.3% recommended return on equity for APS is reasonable.

TABLE 12

Bulkley's Adjusted Return on Equity Estimates

Description	Mean[1] (1)	Adjusted (2)
Constant Growth DCF		
30-Day Average	9.07%	8.58% - 8.88%
90-Day Average	9.14%	8.67% - 8.95%
180-Day Average	9.26%	8.79% - 9.05%
Projected DCF (2022 – 2024)	9.66%	Reject
CAPM DCF-Derived Results (*Bloomberg* Beta)		
Current 30-Yr Treasury (2.57%)	10.07%	8.92%
Near-Term Projected 30-Yr Treasury (2.66%)	10.11%	8.95%
Long-Term Projected 30-Yr Treasury (3.60%)	10.42%	Reject
CAPM DCF-Derived Results (*Value Line* Beta)		
Current 30-Yr Treasury (2.57%)	9.54%	8.47%
Near-Term Projected 30-Yr Treasury (2.66%)	9.58%	8.51%
Long-Term Projected 30-Yr Treasury (3.60%)	9.94%	Reject
Risk Premium		
Current 30-Yr Treasury (2.57%)	9.75%	8.9%
Near-Term Projected 30-Yr Treasury (2.66%)	9.79%	8.9%
Long-Term Projected 30-Yr Treasury (3.60%)	10.20%	Reject
Expected Earnings	10.85% - 11.15%	Reject
Range	10.00% to 10.50%	
Recommended ROE	10.15%	9.3%

Sources: [1]Bulkley Direct, Figure 1 at 5.

As shown in Table 12 above, corrections and improvements to the accuracy of Ms. Bulkley's return on equity estimates support a return on equity for APS of no higher than 9.20% in the current market.

While my adjustments are presented in Adjusted Column 2 of Table 12 above, a description of the basis for my adjustments to Ms. Bulkley's return on equity estimates is presented below.

V.A.1. Ms. Bulkley's Constant Growth DCF

Q PLEASE DESCRIBE MS. BULKLEY'S CONSTANT GROWTH DCF RETURN ESTIMATES.

A Ms. Bulkley's constant growth DCF returns are developed on her Attachment AEB-2DR. Ms. Bulkley's constant growth DCF models are based on consensus growth rates published by *Yahoo! Finance and Zacks* and individual growth rate projections made by *Value Line*.

She relied on dividend yield calculations based on average stock prices over four different time periods: 30-day, 90-day and 180-day ending July 31, 2019. At page 40 of her testimony, she states that "it is reasonable to apply one-half of the expected annual dividend growth rate for purposes of calculating the expected dividend yield component of the DCF model." She asserts that applying this adjustment ensures that the first year dividend yield is representative for the next 12-month period and does not overstate the aggregate dividends to be paid.[42]

Q ARE THE CONSTANT GROWTH DCF RESULTS PRODUCED BY MS. BULKLEY REASONABLE?

A No. I have two major concerns with Ms. Bulkley's DCF study. First, as discussed in regard to my own DCF study, the current consensus analysts' growth rates are substantially higher than the long-term sustainable growth rate of 4.2%. Specifically, Ms. Bulkley's constant growth DCF model is based on an average proxy group growth rate of 5.53%. This growth rate is excessive. Second, I disagree with Ms. Bulkley's methodology to exclude her results for Exelon, PPL Corp., and Sothern Company

[42]Bulkley Direct at 40.

because they are below 7.0%.[43] Using a proxy group median is a more accurate approach to assess the central tendency of the proxy group in the presence of outliers. In Column 2 in Table 12 above and my Attachment CCW-19DR, I present the median results of Ms. Bulkley's constant growth DCF study, which are no higher than 8.8%. Ms. Bulkley's constant growth DCF mean results generally support a return on equity no higher than 9.1% without her adjustment. Importantly, the median results without her adjustment are very similar to Ms. Bulkley's average results. Therefore, Ms. Bulkley's conclusion that the mean results are skewed due to outliers is without merit.

V.A.2. Bulkley's Projected DCF

Q DID MS. BULKLEY PERFORM AN ALTERNATIVE DCF ANALYSIS?

A Yes. Ms. Bulkley also performed a projected DCF analysis based on *Value Line* projected stock prices for 2022-2024 and projected analysts' growth rates, which produced a DCF return of 9.66%, which is about 78 basis points higher than her constant growth DCF return.[44]

Q DO YOU HAVE ANY CONCERNS WITH MS. BULKLEY'S PROJECTED DCF MODEL?

A Yes. Ms. Bulkley's DCF study based on "projected" stock prices does not reflect current market capital costs, or capital market costs that are established by the market participants in the near future when rates will be in effect. Rather, it simply reflects *Value Line*'s estimate of future stock market prices, dividend yields, and resulting DCF studies. Importantly, these projections do not reflect the market valuation of securities.

[43]Bulkley Direct at 42.
[44]Bulkley Direct at 43.

Rather, they reflect *Value Line* projections of future stock prices and dividend payments as assessed by a single analyst. As described in more detail later, security analysts' projections of changes in future capital market costs and interest rates have proven to be unreliable. Indeed, current observable costs of capital are just as likely to reflect future actual capital costs as are security analysts' projections. Therefore, Ms. Bulkley's use of projected stock prices and dividends does not reflect current capital market costs, and is not a reliable estimate of what the future stock market price or a return on equity will be in prospective periods. This model does not rely on observable market data to estimate a fair return.

As such, the DCF returns using this methodology are not reasonable for setting rates because it does not measure the return investors demand to assume the risk of the investment. Hence, her projected stock price DCF methodology simply is fraught with imbalanced estimates of a fair return and should therefore be rejected.

V.B. Bulkley's CAPM Studies

Q PLEASE DESCRIBE MS. BULKLEY'S CAPM ANALYSIS.

A As indicated above, the CAPM analysis is based upon the theory that the market required rate of return for a security is equal to the risk-free rate, plus a risk premium associated with the specific security. The risk premium associated with the specific security is expressed mathematically as:

Bi x (Rm - Rf) where:

Bi = Beta - Measure of the risk for stock
Rm = Expected return for the market portfolio
Rf = Risk-free rate

Q PLEASE DESCRIBE THE ISSUES YOU HAVE WITH MS. BULKLEY'S CAPM STUDY.

A I have two primary issues with Ms. Bulkley's CAPM study. First, I believe the market risk premiums she used in all her CAPM studies are overstated because they do not reflect a reasonable estimate of the expected return on the market. Second, Ms. Bulkley relies on a projected risk-free rate based on the 30-Year Treasury yield for 2021 to 2025. Ms. Bulkley's consistent reliance on projected interest rates is unreasonable and should be rejected.

Q PLEASE DESCRIBE MS. BULKLEY'S MARKET RISK PREMIUMS.

A Ms. Bulkley derived her market risk premiums by conducting a DCF analysis for the market (S&P 500). Ms. Bulkley used three market risk premium estimates of 11.34%, 11.24%, and 10.30% based on a DCF market return of 13.90% less the current, near-term and projected 30-year Treasury bond yields of 2.57%, 2.66%, and 3.60%, respectively.[45]

Q WHAT ISSUES DO YOU HAVE WITH MS. BULKLEY'S DCF-DERIVED MARKET RISK PREMIUM ESTIMATES?

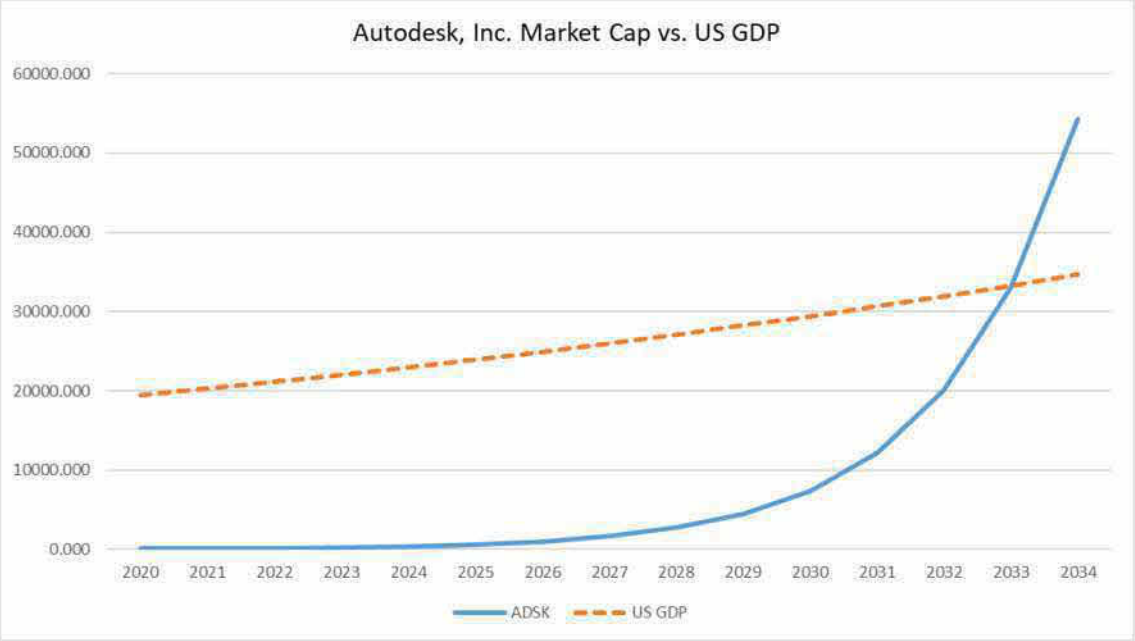
A Ms. Bulkley's DCF-derived market risk premiums are based on a market return of approximately 13.90%, which consists of a weighted average growth rate component of 11.84% and weighted expected dividend yield of approximately 1.94%.[46] As discussed above with respect to my own DCF model, the DCF model requires a long-term sustainable growth rate. Ms. Bulkley's sustainable market growth rate of 11.84% is far too high to be a rational outlook for sustainable long-term market growth. This

[45]Attachment AEB-5DR.
[46]*Id.* (13.90% = 1.94% x (1+0.5(11.84%) + 11.84%).

growth rate is nearly three times the growth rate of the U.S. GDP long-term growth outlook of 4.2%. In fact, Ms. Bulkley's DCF-based expected return on the market includes individual Company growth rates as high as 64.5% (Autodesk, Inc.). To put a growth rate of 64.5% into perspective, it would take a little less than 12 years for Autodesk, Inc.'s reported market capitalization of approximately $51.13 billion to exceed to the most recently reported GDP of the United States of $19.49 trillion, and just over 13 years to outgrow the U.S. economy, assuming the economy grew at 4.2% year over year. In other words, assuming the long-term growth rate of 4.2%, U.S. GDP would reach a nominal level of $34.66 trillion in 2034. Assuming a growth rate of 64.5% for Autodesk as Ms. Bulkley has done, its market capitalization will reach $54.3 trillion by 2034, exceeding the U.S. GDP by $19.66 trillion, or nearly triple the size of our economy. I present this graphically below in Figure 4. This is simply an impossible

outcome, rendering Ms. Bulkley's assumptions unreasonable and economically and financially unfeasible.

FIGURE 4



From another perspective, 271 of the growth rates relied on by Ms. Bulkley are 8.4% or higher, which is two times the projected growth of the U.S. economy. As pointed out in my example above, it simply is not reasonable to believe individual companies, and as a result the overall market, can sustain growth rates as high as Ms. Bulkley has assumed. In fact, in the CFA curriculum textbooks, the CFA Institute notes as follows with regard to earnings growth rates for the companies within the composite indices (*i.e.,* S&P 500):

> Earnings growth for the overall national economy can differ from the growth of earnings per share in a country's equity market composites. This is due to the presence of new businesses that are not yet included in the equity indices and are typically growing at a faster rate than the mature companies that make up the composites. **Thus, the earnings growth rate of companies making up the composites should be**

> **lower than the earnings growth rate for the overall economy.**[47] (emphasis added)

As a result of these unreasonably high long-term market growth rate estimates, Ms. Bulkley's market DCF returns used within her CAPM analysis are inflated and not reliable. Consequently, Ms. Bulkley's market risk premiums should be given no weight in estimating the Company's CAPM-based cost of common equity.

Q ARE THERE OTHER DATA SHOWING HOW UNREASONABLE MS. BULKLEY'S EXPECTED RETURN ON THE MARKET IS?

A Yes. Ms. Bulkley's DCF-derived market return estimate of 13.90% is not sustainable, and is, therefore, unreasonable. In fact, I have compared the market's achieved compound returns over rolling 5, 10, 20, and 50 year periods for the period of 1926 through 2018. In Table 13, I summarize the comparison of Ms. Bulkley's expected return of 13.90% to the observed returns for each of those rolling periods. As shown on Table 13, of the 90 observed rolling 5-year averages, 54 (or 60.0%) of them were lower than Ms. Bulkley's expected market returns 13.90%. This comparison is more revealing as the rolling-averages for longer periods are observed. It should be noted that Ms. Bulkley's projected return on the market exceeds all of the 45 observed rolling 50-years averages.

[47]CFA Program Curriculum, 2014 Level II Vol.1, "Ethical and Professional Standards, Quantitative Methods, and Economics", Paul Kutasovic, Reading 15 – Economic Growth and the Investment Decision, p. 609, footnote 5.

TABLE 13

Observed Geometric Total Returns on the Market Compared to Ms. Bulkley's Expected Market Return of 13.9%

	Rolling Period Compound Returns				Total
	5-Year	10-Year	20-Year	50-Year	93-Year
Rolling periods observed	90	85	75	45	1
Rolling periods w/ returns less than 13.9%	54	57	59	45	1
Percent of periods less than 13.9%	60.0%	67.1%	78.7%	100.0%	100.0%

Q HOW DO YOUR EXPECTED RETURNS ON THE MARKET COMPARE TO THESE SAME ROLLING AVERAGE PERIODS?

A As Shown on Table 14, I have compared my average expected return on the market of 12.16%[48] to the same rolling periods of 5, 10, 20, 50, years. On a rolling 5-year basis, my average expected return on the market of 12.16%, or lower, occurred 51.1% of the time. While 82.2% of the rolling 50-year average observations were less than my average market return of 12.16%, 100% of the observations were lower than Ms. Bulkley's expected market return of 13.9%. For these reasons, it is clear that Ms. Bulkley's expected returns on the market are unsustainable, excessive, and inconsistent with achieved returns on the market. As a result, Ms. Bulkley's expected returns on the market should be rejected.

[48](11.18% + 11.91% + 13.38%) ÷ 3 = 12.16%.

TABLE 14

Observed Geometric Total Returns on the Market Compared to Mr. Walters' Expected Market Return of 12.16%

	Rolling Period Compound Returns				Total
	5-Year	10-Year	20-Year	50-Year	93-Year
Rolling periods observed	90	85	75	45	1
Rolling periods w/ returns less than 12.16%	46	49	47	37	1
Percent of periods less than 12.16%	**51.1%**	**57.6%**	**62.7%**	**82.2%**	100.0%

Q DO YOU HAVE ANY OTHER COMMENTS CONCERNING MS. BULKELY'S CAPM ANALYSIS?

A Yes. I find it curious that Ms. Bulkley expresses how she has little faith in the DCF model as it applies to her proxy group, yet it is the only method she relies on in estimating the expected return on the market. A more balanced approach would be to employ multiple methodologies as I have done. Ms. Bulkley's use of a single model to estimate the market return is biased, and should be rejected.

Q WHY DO YOU BELIEVE MS. BULKLEY'S RELIANCE ON A PROJECTED LONG-TERM RISK-FREE RATE IS UNREASONABLE?

A Ms. Bulkley's use of a long-term projected bond yield of 3.60% does not reflect realistic outlooks for APS's cost of capital during the period rates determined in this proceeding will be in effect. This bond yield is largely based on projections of Treasury bond yields five years out (2021-2025). Ms. Bulkley's long-term projected risk-free rate of 3.6% is double the recent intermediate projection of 1.8%, and more than double the recent 13-week average yield of 1.37%.

Q CAN MS. BULKLEY'S CAPM ANALYSIS BE REVISED TO REFLECT A MORE REASONABLE MARKET RISK PREMIUM AND RECENT RISK-FREE RATES?

A Yes. Subtracting Ms. Bulkley's risk-free rates of 2.57% and 2.66% from my average return on the market of 12.16% produces market risk premium estimates of 9.59% and 9.50% respectively. Applying these corrected market risk premiums to her average *Value Line* and Bloomberg beta estimates of 0.66 and 0.62,[49] respectively, and adding to that her risk-free rates of 2.57% and 2.66%, Ms. Bulkley's CAPM would be no higher than 8.95%. Even if I were to agree with her use of the long-term projected risk-free rate of 3.6%, simply correcting her expected market return and resulting market risk premiums would produce a CAPM of no-higher than 9.3%.

V.C. Bulkley's Bond Yield Plus ("BYP") Risk Premium

Q PLEASE DESCRIBE MS. BULKLEY'S BYP RISK PREMIUM METHODOLOGY.

A As shown on her Attachment AEB-7DR, Ms. Bulkley constructs a risk premium return on equity estimate based on the premise that equity risk premiums are inversely related to interest rates. She estimates the average electric equity risk premiums of approximately 5.9% over the period January 1992 through June 2019. She performs a linear regression using the 30-Year Treasury yield as the independent variable (x-axis) and the risk premium as the dependent variable (y-axis). This model produces a regression formula to which she applies by inputting the current, near-term, and long-term projected 30-year Treasury bond yields of 2.57%, 2.66%, and 3.60%, respectively, which produce estimated electric equity risk premiums of 7.19%, 7.13%, and 6.60%, respectively. She then adds these estimated risk premiums to their corresponding

[49] Attachment AEB-4DR.

levels of interest rates to produce electric return on equity estimates of 9.75%, 9.79%, and 10.20%, respectively.

Q IS MS. BULKLEY'S BYP RISK PREMIUM METHODOLOGY REASONABLE?

A No. Ms. Bulkley contends that there is a simplistic inverse relationship between equity risk premiums and interest rates without any regard to differences in investment risk. Academic studies are quite clear that interest rates are a relevant factor in assessing current market equity risk premiums, but the risk premium ties more specifically to the market's perception of investment risk of debt and equity securities, and not simply changes in interest rates.

More specifically, while academic studies have shown that, in the past, there has been an inverse relationship among these variables, researchers have found that the relationship changes over time and is influenced by changes in perception of the risk of bond investments relative to equity investments, and not simply changes to interest rates.[50]

In the 1980s, equity risk premiums were inversely related to interest rates, but that was likely attributable to the interest rate volatility that existed at that time. As such, when interest rates were more volatile, perceptions of bond investment risk increased relative to the investment risk of equities. This changing investment risk perception caused changes in equity risk premiums.

In today's marketplace, interest rate volatility is not as extreme as it was during the 1980s.[51] Nevertheless, changes in the perceived risk of bond investments relative

[50]Robert S. Harris & Felicia C. Marston, "The Market Risk Premium: "Expectational Estimates Using Analysts' Forecasts," *Journal of Applied Finance*, Volume 11, No. 1, 2001 at 10-13; Eugene F. Brigham, Dilip K. Shome, & Steve R. Vinson, "The Risk Premium Approach to Measuring a Utility's Cost of Equity," *Financial Management*, at 42-43 (Spring 1985).

[51]"The Risk Premium Approach to Measuring a Utility's Cost of Equity," *Financial Management*, at 44 (Spring 1985).

to equity investments still drive changes in equity premiums and cannot be measured simply by observing nominal interest rates. Changes in nominal interest rates are heavily influenced by changes to inflation outlooks, which also change equity return expectations. As such, the relevant factor needed to explain changes in equity risk premiums is the relative changes between the risk of equity versus debt investments, and not simply changes in interest rates.

Importantly, Ms. Bulkley's analysis simply ignores investment risk differentials. She bases her adjustment to the equity risk premium exclusively on changes in nominal interest rates. This is a flawed methodology that does not produce accurate or reliable risk premium estimates.

Q DO YOU BELIEVE THAT THE REGRESSION STUDY USED BY MS. BULKLEY IN HER BYP DEMONSTRATES AN ACCURATE CAUSE AND EFFECT BETWEEN INTEREST RATES AND EQUITY RISK PREMIUMS?

A No. Because the returns on equity she uses are authorized by commissions, those returns on equity are not directly adjusted by market forces. Rather, authorized returns on equity are adjusted by commission policy and regulatory practices, including settled or negotiated outcomes. In contrast, bond interest rates or bond yields are controlled entirely by market forces.

This is significant because regulatory commissions rely on policies and requirements to change authorized returns on equity based on more factors than changes in capital market costs. For example, if capital market costs are declining, a commission may reduce authorized returns on equity at a slower pace than market changes in order to ensure that the approved equity return will support the utility's financial integrity, and possibly will limit significant changes to the utility's revenues and

tariff prices. Utilities have contractual provisions that prevent the refinancing of embedded debt with lower cost market priced marginal debt when capital market costs decline. These limits may cause commissions to exercise caution in reducing authorized equity returns as interest rates decline.

I would note that this opinion is also shared by Moody's, which observed in a 2015 assessment of the utility industry that "ROEs declined in a lagging fashion compared to falling interest rates."[52] Ms. Bulkley's regression study fails to reflect this common sense-based rejection of a causal relationship between returns on equity and changes in bond yields.

Q DO YOU HAVE ANY OTHER COMMENTS CONCERNING MS. BULKLEY'S BYP RISK PREMIUM METHODOLOGY?

A Yes. Similar to her CAPM analysis, in her BYP risk premium, Ms. Bulkley's use of a long-term projected bond yield of 3.60%[53] does not reasonably reflect market participants' outlooks for APS's cost of capital during the period rates determined in this proceeding will be in effect. Therefore, Ms. Bulkley's use of projected bond yields five years out should be rejected.

Q CAN MS. BULKLEY'S BYP RISK PREMIUM ANALYSIS BE REVISED TO REFLECT CURRENT PROJECTIONS OF TREASURY YIELDS?

A As I explain above, my risk premium model takes into consideration risk differentials by assessing yield spreads while also applying considerable weight to the most recent rolling five-year average equity risk premium. In addition, my analysis also incorporates

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[52]"U.S. Regulated Utilities: Lower Authorized Equity Returns Will Not Hurt Near-Term Credit Profiles," *Moody's Investors Service*, at 5, March 10, 2015.

[53]Attachment AEB-7DR.

much more recent data. As such, adding my risk premium over Treasury yields of 7.02% to the more recent projected Treasury yield of 1.9% produces a risk premium estimated ROE of 8.9%.

V.D. Bulkley's Expected Earnings Analysis

Q PLEASE DESCRIBE MS. BULKLEY'S EXPECTED EARNINGS ANALYSIS.

A Ms. Bulkley's Expected Earnings analysis is based on the projected returns on book equity for the electric utility Companies followed by *Value Line* and included in her proxy group as developed on her Attachment AEB-8DR. Based on this analysis, Ms. Bulkley concludes that the average and median return on equity results for her proxy group are 11.15% and 10.81%, respectively, for the projected period 2022-2024.

Q WHAT IS PROBLEMATIC ABOUT MS. BULKLEY'S EXPECTED EARNINGS ANALYSIS?

A Ms. Bulkley's Expected Earnings analysis should be rejected because this approach does not measure the market required return appropriate for the investment risk of APS. Rather, it measures the book accounting return. The market required return is not the same as the accounting return, and the two can be – and in this instance are – vastly different.

The significant discrepancy between the level and meaning of a market-required return and a book return on equity can have significant implications to both investors and customers, when used to set a fair return on equity for ratemaking purposes. Simply stated, a market return provides a pure measure of fair compensation to investors, and allows for setting rates that provide no more than fair compensation. Conversely, using the earned return on book equity can cause

compensation to be either too high or too low, and rates to be set either too low or too high, depending on the specific circumstances when the book return is measured.

For example, if the proxy group's earned return on book equity is lower than the market return, then this could be an indication that the rates for the proxy group are too low and not providing fair compensation. As such, the measured return on book equity would be an indication rates need to be increased. However, if the earned return on book equity was used to estimate a fair return for ratemaking purposes, then this depressed earnings level could result in rates being set below a level that provides fair compensation to investors and may not support the utility's financial integrity. Conversely, if the earned return on book equity for the proxy Companies is above a fair market return on equity, then that could be an indication that the rates for the proxy Companies produce more earnings than necessary to fairly compensate investors, and using this inflated return on equity would result in rates that are not just and reasonable for customers. In other words, the market return on equity is an indication of whether or not earnings are fair and reasonable, whereas the return on book equity generally is used to determine whether or not rate revenues for utilities are either too high or too low. They cannot be used interchangeably.

The market-required return is a long-standing practice in setting rates for utility Companies. This is because the market sets the required rate of return for assuming the risk of an investment. To the extent the utility's earnings are adequate to allow it to attract investors, then it will be able to sell new equity shares to the market to secure capital needed to fund additional rate base investments. If this long-standing practice of setting authorized returns consistent with market returns is rejected, in favor of Ms. Bulkley's proposal to look at returns on book equity, then the balance between estimating a return that is fair to both investors and customers will be turned upside

down, and the rate-setting practice could be substantially impaired and rendered unreliable.

The earned return on book equity is simply not an accurate or legitimate basis upon which to determine a fair and reasonable return on equity for both investors and customers. A fair return on equity is a return that provides fair compensation to utility investors, but also results in customer rate impacts that are no more than necessary to produce that fair compensation – except to the extent greater earnings are necessary to maintain financial integrity or credit standing. For these reasons, the Expected Earnings analysis should simply be rejected.

V.E. Ms. Bulkley's Consideration of Additional Risks

Q DID MS. BULKLEY INJECT CONSIDERATION OF ADDITIONAL BUSINESS RISKS TO JUSTIFY A RETURN ON EQUITY WITHIN HER RANGE?

A Yes. Beginning on page 54 of her testimony, Ms. Bulkley asserts that APS is riskier than the proxy group companies due to its regulatory environment, capital expenditure program, and reliance of nuclear generation.

Q PLEASE RESPOND.

A In short, Ms. Bulkley has cherry-picked these additional factors, or risks, potentially faced by APS without considering other unique risks faced by the proxy group Companies and their operating utility subsidiaries. Ms. Bulkley's concerns can be addressed in at least two ways.

First, to the extent ratings agencies deemed these particular risks detrimental, APS's ratings would have taken them into consideration. As I discussed above, APS's rating from S&P of A- is higher than that of the average proxy group credit rating of

BBB+. APS's additional risks as outlined by Ms. Bulkley have long been known and taken into account by rating agencies like S&P.

In addition, financial theory generally, and the CAPM specifically, is predicated on the idea that investors should only be compensated for taking on market risk, i.e., beta, whereas specific business risk can and will be diversified away. Ms. Bulkley's attempt to compensate investors for specific business risk is contrary to financial theory, and violates the underpinnings of the CAPM, a model which Ms. Bulkley relies on heavily to support her recommended range. For these reasons, Ms. Bulkley's concerns and additional factors should be disregarded.

Q HOW DOES S&P ASSIGN CORPORATE CREDIT RATINGS FOR REGULATED UTILITIES?

A In assigning corporate credit ratings, the credit rating agency considers both business and financial risks. Business risks, among others, include a company's size, competitive position, generation portfolio, and capital expenditure programs, as well as consideration of the regulatory environment, current state of the industry, and the economy as whole. Specifically, S&P states:

> To determine the assessment for a corporate issuer's business risk profile, the criteria combine our assessments of industry risk, country risk, and competitive position. Cash flow/leverage analysis determines a company's financial risk profile assessment. The analysis then combines the corporate issuer's business risk profile assessment and its financial risk profile assessment to determine its anchor. In general, the analysis weighs the business risk profile more heavily for investment-grade anchors, while the financial risk profile carries more weight for speculative-grade anchors.[54]

[54] *Standard & Poor's RatingsDirect:* "Criteria/Corporates/General: Corporate Methodology," November 19, 2013.

Q DID MS. BULKLEY ALSO OFFER AN ASSESSMENT OF CURRENT MARKET CONDITIONS IN SUPPORT OF HER RECOMMENDED RETURN ON EQUITY RANGE?

A Yes. Ms. Bulkley observes a few factors that she believes gauge the capital market environment and investor sentiment, including the impact of the current market condition on dividend yield and P/E ratios, the current and expected interest rate environment, as well as the impact on the tax reform.[55] She concludes that these metrics indicate that the constant growth DCF results underestimate the current cost of equity.[56]

Q DO YOU BELIEVE THAT MS. BULKLEY'S USE OF THESE MARKET SENTIMENTS SUPPORTS HER FINDINGS THAT PACIFICORP'S MARKET COST OF EQUITY IS CURRENTLY IN THE RANGE OF 10.00% TO 10.50%?

A No. A fair analysis of utility securities shows the market generally regards utility securities as low-risk investment instruments and supports the finding that utilities' cost of capital is very low in today's marketplace.

Q WHAT IS THE MARKET SENTIMENT FOR UTILITY INVESTMENTS?

A As discussed above the market is placing high value on utility securities, recognizing their low risk and stable characteristics. This is illustrated by current utility bond yield spreads as discussed at length previously. The current strong utility bond valuation is an indication of the market's sentiment that utility bonds are lower risk and are generally regarded as a safe haven by the investment industry.

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[55] Bulkley Direct at 11-30.
[56] *Id.* at 38-39, and 43.

Further, other measures of utility stock valuations also support the conclusion that there is a robust market for utility stocks. As shown on my Attachment CCW-2DR, financial valuation measures (*e.g.*, P/E ratio and market price to cash flow ratio) show that utility stock valuation measures are robust.

For all these reasons, direct assessments of valuation measures and market sentiment toward utility securities support the credit rating agencies' findings, as quoted above, that the utility industry is largely regarded as a low-risk, safe haven investment. All of this supports my finding that utilities' market cost of equity is very low in today's very low-cost capital market environment.

Q DO YOU HAVE ANY COMMENTS CONCERNING MS. BULKLEY'S RELIANCE ON PROJECTED INTEREST RATES?

A Yes. Ms. Bulkley develops her CAPM and risk premium studies mainly relying on near-term and long-term projected interest rates, which she believes are expected to increase.[57] Ms. Bulkley's primary reliance on forecasted Treasury bond yields is unreasonable because she is not considering the highly likely outcome that current observable interest rates will prevail during the period in which rates determined in this proceeding will be in effect. This is important because, while current observable interest rates are actual market data that provides a measure of the current cost of capital, the accuracy of forecasted interest rates is highly problematic.

[57]Bulkley Direct at 45.

Q WHY DO YOU BELIEVE THAT THE ACCURACY OF FORECASTED INTEREST RATES IS HIGHLY PROBLEMATIC?

A Over the last several years, observable current interest rates have been a more accurate predictor of future interest rates than economists' consensus projections. Attachment CCW-20DR illustrates this point. Specifically, on Attachment CCW-20DR, under Columns 1 and 2, I show the actual market yield for Treasury bonds at the time a projection is made, and the corresponding projection for Treasury bond yields two years in the future, respectively.

As shown in Columns 1 and 2 of Attachment CCW-20DR, over the last several years, Treasury yields were projected to increase relative to the actual Treasury yields at the time of the projection. In Column 4, I show the actual Treasury yield two years after the forecast. In Column 5, I show the actual yield change at the time of the projections relative to the projected yield change.

As shown in Attachment CCW-20DR, economists have consistently projected that interest rates will increase over the near term. However, as shown in Column 5, those yield projections turned out to be overstated in almost every case. Indeed, actual Treasury yields have decreased or remained flat over the last several years rather than increasing as the economists' projections indicated. As such, current observable interest rates are just as likely to accurately predict future interest rates as are economists' projections.

VI. FAIR VALUE RATE OF RETURN

VI.A. Response to Ms. Bulkley's Fair Value Rate of Return Analysis

Q HOW DID MS. BULKLEY ESTIMATE THE RATE OF RETURN TO BE APPLIED TO THE FAIR VALUE INCREMENT?

A As Ms. Bulkley notes in her testimony, the Commission has recently applied one-half of the real risk-free rate, or the nominal yield adjusted for inflation. Ms. Bulkley provided three estimates of the real risk-free rate of return and they are developed on her Attachment AEB-14DR. In Scenario 1, Ms. Bulkley calculates an average inflation forecast from three different projections of inflation. She observes the long-term 5- and 10-year projections through 2030 from Blue Chip Financial Forecasts (2.1%), she calculates the compound annual growth rate implied in the CPI projections for 2020 through 2030 from EIA data (2.31%), and she calculates the compound annual growth rate implied in the GDP Chain-type Price Index projections for 2020 through 2030 from EIA data (2.35%). These three estimates produce an average projected level of inflation of 2.25%. She observes the long-term 5- and 10-year projected 30-year Treasury yield through 2030 from Blue Chip Financial Forecasts (3.7%). Ms. Bulkley then removes the expected level of inflation (2.25%) from the projected Treasury yield (3.7%) to produce a real risk-free rate of 1.41%.

In her Scenario 2, Ms. Bulkley begins with the 3.7% projected 30-year Treasury yield described in her Scenario 1 and removes from it, the 180-day average yield on 30-year US. Treasury Inflation Protected Securities ("TIPS") of 0.98%. She asserts this produces a real risk free rate of return of 2.72% (3.70% - 0.98% = 2.72%).

As an alternative, Ms. Bulkley provides her Scenario 3, where she uses the normalized nominal risk-free rate of 3.50% as recommended by Duff & Phelps and

removes from it the 180-day average TIPS yield of 0.98% described above. She asserts this produces a real-risk free rate of 2.52%.

The average real risk-free rate produced by Ms. Bulkley's three scenarios is 2.22%. According to this Commission's methodology, half, or 1.11% would be the cost rate applied to the fair value increment. Nevertheless, APS has requested a cost rate of 1.0%.

Q DO YOU HAVE ANY COMMENTS CONCERNING MS. BULKLEY'S ESTIMATES OF THE REAL RISK-FREE RATE OF RETURN?

A Yes. I have serious concerns with the real risk-free rates Ms. Bulkley calculated in her Scenarios 2 and 3. In each of these two Scenarios, Ms. Bulkley erroneously treats the 180-day average TIPS yield as a measure of inflation that she removes from her projected nominal yields in order to calculate what she is calling an estimate of the real risk-free rate. As Ms. Bulkley explains in her testimony:

> In scenario 2, the estimate of inflation was based on the 180-day average yield on the 30-year U.S. Treasury Inflation Protected Securities (TIPS). This resulted in an estimate of inflation of 0.98 percent, which is similar to the estimate that has been relied on in recent cases before the Commission. The resulting real risk-free rate after adjusting for inflation is 2.72 percent.[58]

She relied on the same 0.98% TIPS yield as the rate of inflation in her scenario 3. The error in this methodology is that the TIPS yield is a measure of the real risk-free rate of return not a measure of inflation. In other words, her 180-day average TIPS yield of 0.98% is the real risk-free rate, not the underlying rate of inflation. For example, what Ms. Bulkley has essentially calculated in her Scenario 2 is known as the breakeven inflation rate between her projected Treasury bond yield of 3.7% and the TIPS yield of

[58]Bulkley Direct at 71. (emphasis added)

0.98%, not the real risk-free rate. In other words, the 2.72% figure shown on Ms. Bulkley's Scenario 2 represents the simple breakeven inflation indicated between the TIPS yield of 0.98% and the nominal 30-year yield of 3.7%. Similarly, the 2.52% figure labeled as the "real risk-free rate" on her Scenario 3 is actually the breakeven inflation rate between the Duff & Phelps normalized risk-free rate of 3.5% and the TIPS yield of 0.98%.

Q CAN THERE BE CORRECTIONS MADE TO MS. BULKLEY'S SCENARIOS 2 AND 3 TO ESTIMATE THE REAL RISK FREE RATE?

A Yes. In order to correctly calculate the market's expected rate of inflation based on TIPS yields for the 180-day period assumed in her study period, she would also need to calculate the 180-day average nominal 30-year Treasury yield over the same time period. The average nominal 30-year Treasury yield for the 180-day period ending August 13, 2019 was 2.86%. The spread then is 1.88%. Ms. Bulkley provides the estimate in response to FEA 5.3. This adjustment is shown below in Table 15.

TABLE 15

Corrected Market-Derived Inflation

Description	Average Yield[1] Nominal Yield (1)	TIPS Yield (2)	Expected Inflation[2] (3)
Bulkley's Study Period[3]	2.86%	0.98%	1.88%
Walters' Study Period[4]	1.51%	-0.03%	1.55%

[1] https://fred.stlouisfed.org
[2] Col. 3 = Col. 1 - Col. 2
[3] Response to FEA 5.3
[4] 180 Trading Days Ending Sep 18, 2020

Replacing the incorrect rate of inflation of 0.98% shown on her Scenario 2 with the correct rate of inflation of 1.88% would produce a corrected real risk-free rate of 1.82%. Correcting the same error in her Scenario 3 would produce a real risk-free rate of 1.62%. Ms. Bulkley provided the revised estimates in response to FEA 5.3, attached here as Attachment CCW-21DR. The corrected estimates of the inflation and the resulting real-risk free rate are shown below in Table 16.

TABLE 16

Corrected Bulkley Real Risk-Free Rates

	Scenario 1	Scenario 2	Scenario 3
Nominal Yield[1]	3.70%	3.70%	3.50%
Estimated Inflation[2]	2.25%	1.88%	1.88%
Real Risk-Free Rate	1.41%	1.82%	1.62%
Average Real Risk-Free Rate		1.62%	

[1]Attachment AEB-14DR.

[2]Inflation of 2.25% came from Attachment AEB-14DR; 1.88% inflation is shown above in Table 15.

These corrections would lower the average of her three scenarios from 2.22% to 1.62%. Therefore, the cost rate that would be applied to the fair value increment would be 0.81% rather than APS's requested 1.0%. If the Commission were to require a cost rate be applied to the fair value increment, I urge the Commission reject Ms. Bulkley's faulty analysis that APS relied on in support of its overstated request. Additionally, as I will explain below, current data indicates that a fair value increment of 0.81% is still too high.

VI.B. Development of a Fair Value Rate of Return

Q IN GENERAL, DO YOU AGREE WITH THE FAIR VALUE INCREMENT METHODOLOGY?

A No, I do not. However, it is my understanding that fair value increment methodology has been employed in Arizona for quite some time, and as Ms. Bulkley summarizes in her testimony, the Commission has noted that under the Arizona Constitution a public

utility is entitled to a fair return on the fair value of its property devoted to public uses. The Commission typically applies a separate rate of return to the FVRB above the OCRB, generally known as the fair value increment. The Commission has recently applied a return of one-half of the real risk-free rate as the return component on the fair value increment. As such, I will offer estimates of the real risk-free rate that can be used to calculate the return on the fair value increment.

Q HAVE YOU CALCULATED YOUR OWN ESTIMATES OF THE REAL RISK-FREE WITH UPDATED DATA?

A Yes. I have employed the same three scenarios as Ms. Bulkley, with the corrections as described above with more recently available data. In my Scenario 1, the long-term projected nominal 30-year U.S. Treasury bond yield is 3.4% and the average long-term projected rate of inflation from *Blue Chip Financial Forecast* and the EIA is 2.29%. Removing the projected inflation of 2.29% from the nominal yield of 3.4% produces a projected real risk-free rate of 1.09%.

In my Scenario 2, I used the same 3.4% projected nominal 30-year U.S. Treasury bond yield described in my Scenario 1. To estimate the rate of inflation, I calculated the breakeven inflation rate between the average yield on 30-year U.S. Treasury bonds (1.51%) and 30-year TIPS (-0.03%) for the 180-trading day period ending September 18, 2020. As shown above, the market's expected inflation rate based on these yields is 1.55%. Removing the projected inflation of 1.55% from the nominal yield of 3.4% produces a projected real risk-free rate of 1.85%.

In my Scenario 3, I used the normalized nominal risk-free rate as published by *Duff & Phelps*, which has been revised to 2.5%. I used the same expected rate of

inflation explained in my Scenario 2. Removing the projected inflation of 1.55% from the nominal yield of 2.5% produces a projected real risk-free rate of 0.95%.

Should the Commission adopt a fair value increment, based on my analyses, it is my opinion that a fair value increment cost rate of no higher than 0.65% be used.

The analyses are shown in my Attachment CCW-22DR and summarized in Table 17.

TABLE 17

Summary or Real Risk-Free Rate Estimates

	Scenario 1	Scenario 2	Scenario 3
Real Risk-Free Rate[1]	1.09%	1.85%	0.95%
Average of all Scenarios		1.30%	
Cost Rate for FV Increment		0.65%	

[1]Attachment CCW-22DR.

Q DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A Yes, it does.

Qualifications of Christopher C. Walters

Q PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A Christopher C. Walters. My business address is 16690 Swingley Ridge Road, Suite 140, Chesterfield, MO 63017.

Q PLEASE STATE YOUR OCCUPATION.

A I am an Associate with the firm of Brubaker & Associates, Inc. ("BAI"), energy, economic and regulatory consultants in the field of public utility regulation.

Q PLEASE STATE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EMPLOYMENT EXPERIENCE.

A I received a Bachelor of Science Degree in Business Economics and Finance from Southern Illinois University Edwardsville. I have also received a Master of Business Administration Degree from Lindenwood University.

As an Associate at BAI, I perform detailed technical analyses and research to support regulatory projects including expert testimony covering various regulatory issues. Since my career at BAI began in 2011, I have held the positions of Analyst, Associate Consultant, Consultant, Senior Consultant, and Associate. Throughout my tenure, I have been involved with several regulated projects for electric, natural gas and water and wastewater utilities, as well as competitive procurement of electric power and gas supply. My regulatory project work includes estimating the cost of equity capital, capital structure evaluations, assessing financial integrity, merger and acquisition related issues, risk management related issues, depreciation rate studies, and other revenue requirement issues.

BAI was formed in April 1995. BAI and its predecessor firm have participated in more than 700 regulatory proceedings in 40 states and Canada.

BAI provides consulting services in the economic, technical, accounting, and financial aspects of public utility rates and in the acquisition of utility and energy services through RFPs and negotiations, in both regulated and unregulated markets. Our clients include large industrial and institutional customers, some utilities and, on occasion, state regulatory agencies. We also prepare special studies and reports, forecasts, surveys and siting studies, and present seminars on utility-related issues.

In general, we are engaged in energy and regulatory consulting, economic analysis and contract negotiation. In addition to our main office in St. Louis, the firm also has branch offices in Phoenix, Arizona and Corpus Christi, Texas.

Q HAVE YOU EVER TESTIFIED BEFORE A REGULATORY BODY?

A Yes. I have sponsored testimony before state regulatory commissions including: Arkansas, Delaware, Florida, Illinois, Iowa, Kansas, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Missouri, Nevada, Ohio, Oklahoma, Utah, and Wyoming. In addition, I have also sponsored testimony before the City Council of New Orleans and an affidavit before the FERC.

Q PLEASE DESCRIBE ANY PROFESSIONAL REGISTRATIONS OR ORGANIZATIONS TO WHICH YOU BELONG.

A I earned the Chartered Financial Analyst ("CFA") designation from the CFA Institute. The CFA charter was awarded after successfully completing three examinations which covered the subject areas of financial accounting and reporting analysis, corporate finance, economics, fixed income and equity valuation, derivatives, alternative

investments, risk management, and professional and ethical conduct. I am a member of the CFA Institute and the CFA Society of St. Louis.

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Arizona Public Service Company

Rate of Return

Line	Description		Amount (1)	Weight (2)	Cost (3)	FEA Recommended Weighted Cost (4)	FEA Recommended Pre-Tax Weighted Cost (5)
	Original Cost Rate Base						
1	Long-Term Debt	$	4,726.1	45.33%	4.10%	1.86%	1.86%
2	Common Equity	$	5,701.0	54.67%	**9.30%**	5.08%	6.75%
3	**Total**	**$**	**10,427.1**	**100.00%**		**6.94%**	**8.61%**
	Rate of Return with 0.65% Fair Value Increment						
4	Long-Term Debt	$	4,022.1	32.67%	4.10%	1.34%	1.34%
5	Common Equity	$	4,850.9	39.41%	**9.30%**	3.66%	4.86%
6	FVRB Increment	$	3,437.3	27.92%	**0.65%**	0.18%	0.24%
7	**Total**	**$**	**12,310.3**	**100.00%**		**5.18%**	**6.44%**

Sources:
Schedule D-1.
Attachment CCW-22DR, page 1

Arizona Public Service Company

Electric Utilities
(Valuation Metrics)

Line	Company	Price to Earnings (P/E) Ratio [1] 18-Year Average (1)	2020 [2] (2)	2019 [3] (3)	2018 (4)	2017 (5)	2016 (6)	2015 (7)	2014 (8)	2013 (9)	2012 (10)	2011 (11)	2010 (12)	2009 (13)	2008 (14)	2007 (15)	2006 (16)	2005 (17)	2004 (18)	2003 (19)	2002 (20)
1	ALLETE	17.85	17.90	24.70	17.23	23.05	18.63	15.06	17.23	18.59	15.88	14.66	15.98	16.08	13.95	14.78	16.55	17.91	25.21	N/A	N/A
2	Alliant Energy	16.51	23.20	21.20	16.60	20.60	22.30	18.07	16.60	15.28	14.50	14.45	12.47	13.86	13.43	15.08	16.82	12.59	14.00	12.69	19.93
3	Ameren Corp.	16.22	22.20	22.10	16.71	20.60	18.29	17.55	16.71	16.52	13.35	11.93	9.66	9.26	14.21	17.45	19.39	16.72	16.28	13.51	15.78
4	American Electric Power	14.56	17.90	21.40	15.88	19.33	15.16	15.77	15.88	14.49	13.77	11.92	13.42	10.03	13.06	16.27	12.91	13.70	12.42	10.66	12.68
5	Avangrid, Inc.	26.84	24.60	20.90	N/A	27.27	20.49	40.94	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	Avista Corp.	17.86	19.30	15.30	17.28	23.37	18.80	17.60	17.28	14.64	19.30	14.08	12.74	11.42	14.97	30.88	15.39	19.45	24.43	13.84	19.27
7	Black Hills	17.93	16.90	21.70	19.03	19.48	22.29	16.14	19.03	18.24	17.13	31.13	18.10	9.93	N/A	15.02	15.77	17.27	17.13	15.95	12.52
8	CenterPoint Energy	15.07	16.20	19.50	16.96	17.91	21.91	18.10	16.96	18.75	14.85	14.58	13.78	11.81	11.27	15.00	10.27	19.06	17.84	6.05	5.59
9	CMS Energy Corp.	17.57	23.30	24.30	17.30	21.32	20.94	18.29	17.30	16.32	15.07	13.62	12.46	13.56	10.87	26.84	22.18	12.60	12.39	N/A	N/A
10	Consol. Edison	15.74	17.80	21.80	15.90	19.77	18.80	15.59	15.90	14.72	15.39	15.08	13.30	12.55	12.29	13.78	15.49	15.13	18.21	14.30	13.28
11	Dominion Resources	18.54	22.00	NMF	22.97	22.17	21.33	22.14	22.97	19.25	18.91	17.27	14.35	12.74	13.78	20.63	15.98	24.89	15.07	15.24	12.05
12	DTE Energy	15.62	17.10	19.90	14.91	18.59	18.97	18.11	14.91	17.92	14.89	13.51	12.27	10.41	14.81	18.27	17.43	13.80	16.04	13.69	11.28
13	Duke Energy	16.94	16.10	17.80	17.91	19.93	21.25	18.22	17.91	17.45	17.46	13.76	12.69	13.32	17.28	16.13	N/A	N/A	N/A	N/A	N/A
14	Edison Int'l	13.88	13.70	14.30	13.05	17.23	17.92	14.77	13.05	12.70	9.71	11.81	10.32	9.72	12.36	16.03	12.99	11.74	37.59	6.97	7.78
15	El Paso Electric	18.26	33.70	23.20	16.38	21.78	18.66	18.33	16.38	15.88	14.47	12.60	10.72	10.79	11.89	15.26	16.92	26.72	22.03	18.26	22.99
16	Entergy Corp.	13.90	19.60	16.50	12.89	15.01	10.92	12.53	12.89	13.21	11.22	9.06	11.57	11.98	16.56	19.30	14.28	16.28	15.09	13.77	11.53
17	Eversource Energy	18.20	24.60	22.10	17.92	19.47	18.69	18.11	17.92	16.94	19.86	15.35	13.42	11.96	13.66	18.75	27.07	19.76	20.77	13.35	16.07
18	Evergy, Inc.	20.10	18.40	21.80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	Exelon Corp.	14.47	12.90	15.80	16.02	13.41	18.68	12.58	16.02	13.43	19.08	11.30	10.97	11.49	17.97	18.22	16.53	15.37	12.99	11.77	10.46
20	FirstEnergy Corp.	18.48	11.20	23.60	39.79	11.41	15.91	17.02	39.79	13.06	21.10	22.39	11.75	13.02	15.64	15.59	14.23	16.07	14.13	22.47	12.95
21	Fortis Inc.	19.63	20.50	19.20	24.29	16.81	21.60	18.00	24.29	19.97	20.12	18.79	18.22	16.36	17.48	21.14	17.68	N/A	N/A	N/A	N/A
22	Great Plains Energy	15.58	N/A	N/A	16.47	NMF	17.98	19.37	16.47	14.19	15.53	16.11	12.10	16.03	20.55	16.35	18.30	13.96	12.59	12.23	11.09
23	Hawaiian Elec.	18.33	22.40	22.30	15.88	20.69	13.56	20.40	15.88	16.21	15.81	17.09	18.59	19.79	23.16	21.57	20.33	18.27	19.18	13.76	13.47
24	IDACORP, Inc.	16.43	19.80	23.00	14.67	20.60	19.06	16.22	14.67	13.45	12.41	11.54	11.83	10.20	13.93	18.19	15.07	16.70	15.49	26.51	18.88
25	MGE Energy	18.99	24.30	28.40	17.19	29.36	24.90	20.28	17.19	17.01	17.23	15.82	14.98	15.14	14.22	15.01	15.88	22.40	17.98	17.55	15.96
26	NextEra Energy, Inc.	17.22	29.70	26.80	17.25	21.65	20.71	16.89	17.25	16.57	14.43	11.54	10.83	13.42	14.48	18.90	13.65	17.88	13.65	17.88	13.60
27	NorthWestern Corp	16.88	16.10	19.80	16.24	17.85	17.19	18.36	16.24	16.86	15.72	12.62	12.90	11.54	13.87	21.74	25.95	17.09	N/A	N/A	N/A
28	OGE Energy	15.29	15.00	19.00	18.27	18.32	17.68	17.69	18.27	17.69	15.16	14.37	13.31	10.83	12.41	13.75	13.68	14.95	14.13	11.84	14.12
29	Otter Tail Corp.	23.61	17.40	23.50	18.84	22.06	20.19	18.20	18.84	21.12	21.75	47.48	55.10	31.16	30.06	19.02	17.35	15.40	17.34	17.77	16.01
30	PG&E Corp.	16.68	N/A	N/A	15.00	18.28	21.13	26.40	15.00	23.67	20.70	15.46	15.80	13.01	12.08	16.85	14.84	15.37	13.81	9.50	N/A
31	Pinnacle West Capital	15.87	16.60	20.50	15.89	19.28	18.74	16.04	15.89	15.27	14.35	14.60	12.57	13.74	16.07	14.93	13.69	19.24	15.80	13.96	14.43
32	PNM Resources	18.22	20.50	21.80	18.68	20.43	19.83	16.85	18.68	16.13	14.97	14.53	14.05	18.09	N/A	35.65	15.57	17.38	15.02	14.73	15.08
33	Portland General	16.60	18.40	21.90	15.32	20.03	19.06	17.71	15.32	16.88	13.98	12.37	12.00	14.40	16.30	11.94	23.35	N/A	N/A	N/A	N/A
34	PPL Corp.	14.06	11.40	13.10	14.08	17.65	12.83	13.92	14.08	12.84	10.88	10.52	11.93	25.69	17.64	17.26	14.10	15.12	12.51	10.59	11.06
35	Public Serv. Enterprise	13.51	14.80	15.90	12.61	16.31	15.35	12.41	12.61	13.50	12.79	10.40	10.37	10.04	13.65	16.54	17.81	16.74	14.26	10.58	10.00
36	SCANA Corp.	13.94	N/A	N/A	13.68	14.46	16.80	14.67	13.68	14.43	14.80	13.67	12.93	11.63	12.67	14.96	15.42	14.44	13.57	13.05	12.17
37	Sempra Energy	15.57	16.70	23.00	21.87	24.33	24.37	19.73	21.87	19.68	14.89	11.77	12.60	10.09	11.80	14.01	11.50	11.79	8.65	8.96	8.19
38	Southern Co.	15.90	17.20	18.00	16.04	15.48	17.76	15.85	16.04	16.19	16.97	15.85	14.90	13.52	16.13	15.95	16.19	15.92	14.68	14.83	14.63
39	Vectren Corp.	17.22	N/A	N/A	19.98	23.54	19.18	17.92	19.98	20.66	15.02	15.83	15.10	12.89	16.79	15.33	18.92	15.11	17.57	14.80	14.16
40	WEC Energy Group	16.88	24.60	23.50	17.71	20.01	19.95	21.33	17.71	16.50	15.76	14.25	14.01	13.35	14.77	16.47	15.97	14.46	17.51	12.43	10.46
41	Westar Energy	15.56	N/A	N/A	15.36	23.40	21.59	18.45	15.36	14.04	13.43	14.78	12.96	14.95	16.96	14.10	12.18	14.79	17.44	10.78	14.02
42	Xcel Energy Inc.	17.34	23.30	22.70	15.44	20.20	18.48	16.54	15.44	15.04	14.82	14.24	14.13	12.66	13.69	16.65	14.80	15.36	13.65	11.62	40.80
43	Average	16.71	19.39	20.84	17.39	19.81	18.97	18.00	17.39	16.38	15.69	15.30	14.28	13.56	15.18	17.74	16.47	16.52	16.57	13.70	14.31
44	Median	16.10	18.40	21.75	16.54	19.97	18.80	17.71	16.54	16.27	15.04	14.31	12.91	12.82	14.21	16.41	15.88	15.92	15.29	13.60	13.47

Sources:

[1] The Value Line Investment Survey Investment Analyzer Software, downloaded on June 25, 2019.

[2] The Value Line Investment Survey, July 24, August 14, and September 11, 2020.

[3] The Value Line Investment Survey, January 24, February 14, and March 13, 2020.

Arizona Public Service Company

Electric Utilities
(Valuation Metrics)

Line	Company	Market Price to Cash Flow (MP/CF) Ratio [1]																			
		19-Year Average	2020 [2/a]	2019 [3/a]	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1	ALLETE	9.51	9.36	11.13	10.16	10.95	8.26	7.49	8.80	9.15	8.18	7.91	8.04	8.51	9.29	10.30	11.06	11.54	11.46	N/A	N/A
2	Alliant Energy	7.93	10.32	10.48	9.71	13.21	10.67	8.86	8.40	7.52	7.50	7.21	6.59	6.23	7.49	7.92	8.00	5.09	5.52	4.76	5.20
3	Ameren Corp.	7.13	8.93	9.20	7.95	8.38	7.44	6.87	6.95	6.61	5.48	5.02	4.23	4.25	6.35	7.69	8.57	8.57	8.24	6.74	7.96
4	American Electric Power	6.53	8.72	9.01	8.03	8.81	7.57	7.09	7.00	6.57	5.93	5.46	5.54	4.71	5.71	6.84	5.54	6.07	5.50	4.69	5.19
5	Avangrid, Inc.	9.70	8.75	9.20	10.24	10.14	8.56	11.30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	Avista Corp.	6.84	8.51	7.50	10.14	9.35	7.63	6.76	7.30	6.21	6.88	6.40	5.80	4.06	5.12	7.58	5.30	6.58	7.58	5.36	5.90
7	Black Hills	7.86	9.45	10.42	8.83	9.20	9.33	8.06	8.81	8.03	6.04	7.85	6.16	4.25	11.26	7.62	6.92	7.57	6.69	6.89	5.92
8	CenterPoint Energy	5.16	5.51	6.76	8.45	6.97	5.96	5.75	6.25	6.56	5.15	5.39	4.70	4.05	4.29	5.17	3.94	4.70	4.26	2.08	2.16
9	CMS Energy Corp.	6.05	9.22	9.62	8.40	8.75	8.50	7.53	7.13	6.68	6.03	5.41	4.48	3.64	3.45	5.57	4.40	4.04	3.20	2.88	NMF
10	Consol. Edison	8.31	8.83	9.78	8.73	9.64	9.39	7.96	7.89	7.77	8.31	8.15	7.39	6.72	6.89	8.31	8.65	8.59	9.31	7.90	7.64
11	Dominion Resources	9.68	11.27	12.82	10.94	11.35	11.59	11.84	12.27	10.88	9.92	9.45	8.12	6.98	8.27	8.65	7.81	10.09	7.68	7.51	6.53
12	DTE Energy	6.41	7.16	9.32	8.54	9.05	8.64	8.52	6.42	6.65	5.91	5.18	4.69	3.59	4.90	5.73	5.21	5.54	6.00	5.62	5.20
13	Duke Energy	7.54	6.86	7.62	7.65	8.40	8.57	7.95	8.12	8.11	9.53	6.56	6.01	5.96	7.13	7.16	N/A	N/A	N/A	N/A	N/A
14	Edison Int'l	5.86	5.95	7.42	13.46	7.05	6.77	5.92	5.68	5.46	4.59	4.22	4.11	3.95	5.63	7.01	5.87	5.61	6.84	2.82	2.96
15	El Paso Electric	6.38	11.07	9.20	9.43	8.54	7.46	6.47	6.33	6.19	5.78	5.16	4.31	3.98	4.95	6.44	6.25	6.67	4.65	3.90	4.39
16	Entergy Corp.	5.76	6.38	5.97	4.92	4.66	4.01	4.11	4.21	4.03	4.23	3.90	4.66	5.68	7.96	9.21	7.16	8.76	7.12	6.84	5.57
17	Eversource Energy	7.12	11.77	10.47	9.16	10.36	10.14	10.12	10.14	8.08	9.30	6.99	4.97	4.61	4.12	6.18	6.02	3.55	3.78	2.85	2.75
18	Evergy, Inc.	8.47	8.41	8.52	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	Exelon Corp.	6.00	4.48	5.26	5.05	4.45	4.80	4.70	5.09	4.61	5.54	5.86	5.10	5.98	9.65	9.89	8.62	7.97	6.29	5.71	4.97
20	FirstEnergy Corp.	6.80	10.83	10.41	8.84	4.76	5.12	5.38	7.43	6.15	7.42	7.33	4.49	4.91	7.58	7.89	7.53	6.04	5.15	6.90	5.10
21	Fortis Inc.	8.31	9.01	9.27	7.97	8.23	10.46	7.29	9.25	7.93	8.09	8.38	7.40	6.76	7.58	9.18	7.89	N/A	N/A	N/A	N/A
22	Great Plains Energy	6.89	N/A	N/A	N/A	14.62	8.63	6.66	6.45	5.73	6.09	5.74	4.49	5.06	7.71	7.13	7.68	6.70	6.52	5.92	5.14
23	Hawaiian Elec.	8.16	10.31	9.51	8.34	9.21	7.44	9.25	7.64	8.15	8.05	7.73	7.81	6.95	9.10	7.95	8.47	8.29	8.44	6.12	6.20
24	IDACORP, Inc.	8.53	11.28	12.79	11.72	11.56	10.95	9.37	8.59	7.78	7.05	6.64	6.52	5.31	7.10	8.23	7.73	7.55	7.15	7.27	7.53
25	MGE Energy	11.46	13.88	15.04	15.04	17.33	15.66	12.53	11.42	11.20	10.77	9.48	9.05	8.40	8.42	9.23	9.30	11.73	11.04	10.20	8.09
26	NextEra Energy, Inc.	8.08	13.16	12.28	10.76	11.62	9.23	7.93	7.98	7.60	7.58	5.98	5.33	6.09	7.34	9.02	6.51	6.71	6.71	5.97	5.77
27	NorthWestern Corp	7.78	9.17	9.44	8.19	8.82	8.65	8.99	9.01	7.61	6.85	5.89	5.79	5.05	5.57	8.45	9.39	7.31	8.13	N/A	N/A
28	OGE Energy	7.94	8.57	10.42	9.36	10.52	9.03	9.25	10.65	9.93	7.35	7.48	6.61	5.37	6.43	7.58	7.50	7.04	6.73	5.62	5.39
29	Otter Tail Corp.	9.51	10.85	12.60	11.58	11.09	9.38	9.04	9.45	9.58	8.43	9.04	8.07	8.01	11.65	9.53	8.66	8.18	9.01	8.13	8.33
30	PG&E Corp.	5.55	N/A	N/A	- 5.65	7.09	7.26	7.24	5.65	6.84	5.86	5.32	5.42	4.71	4.61	5.84	5.28	5.07	5.13	4.05	14.69
31	Pinnacle West Capital	6.24	7.33	8.21	7.09	8.73	7.89	6.91	7.03	6.85	6.34	5.80	5.65	3.84	4.19	4.76	4.48	7.48	5.88	4.80	5.21
32	PNM Resources	6.84	7.63	7.99	7.57	7.40	7.64	6.95	7.48	6.47	5.80	4.94	4.58	4.53	7.10	10.67	7.50	7.62	6.84	5.55	5.72
33	Portland General	5.90	7.16	7.31	6.56	7.45	7.12	6.73	5.49	6.06	5.08	4.86	4.13	4.63	4.81	5.34	5.74	N/A	N/A	N/A	N/A
34	PPL Corp.	7.44	6.54	8.11	7.02	10.11	8.37	8.73	7.32	6.59	5.87	5.98	7.46	8.82	9.17	8.90	7.58	7.57	6.49	5.41	5.30
35	Public Serv. Enterprise	7.51	7.63	8.63	9.48	8.67	8.56	6.66	6.48	6.40	6.40	6.03	6.04	6.20	8.46	9.83	8.41	8.59	7.17	6.79	6.24
36	SCANA Corp.	7.09	N/A	N/A	N/A	8.26	9.59	8.33	7.50	7.49	7.40	6.75	6.52	5.88	6.38	7.15	7.03	5.40	6.86	6.59	6.36
37	Sempra Energy	8.06	9.88	11.69	10.10	10.65	10.88	9.99	10.77	9.37	7.26	6.13	6.53	6.07	7.07	8.61	7.22	6.96	5.16	4.85	4.00
38	Southern Co.	8.19	8.77	8.54	7.05	7.49	8.83	8.23	8.42	8.30	8.75	8.22	7.79	7.08	8.18	8.62	8.47	8.41	8.28	8.28	7.83
39	Vectren Corp.	7.08	N/A	N/A	N/A	10.32	8.60	7.82	7.57	6.82	5.79	5.81	5.58	5.24	6.90	6.53	7.37	7.06	7.63	7.27	6.92
40	WEC Energy Group	8.86	12.96	12.66	10.82	11.04	10.95	12.90	10.27	9.58	9.24	8.43	8.15	6.87	7.57	7.84	7.27	6.40	6.27	4.91	4.27
41	Westar Energy	6.91	N/A	N/A	N/A	10.87	10.86	9.05	7.93	7.23	6.71	6.67	5.51	5.32	7.09	6.88	5.81	7.00	6.54	4.24	2.94
42	Xcel Energy Inc.	6.75	9.13	9.18	7.90	8.50	8.10	7.62	7.31	7.00	6.85	6.47	6.28	5.43	5.71	6.51	5.54	5.62	5.31	4.27	5.46
43	Average	7.42	9.05	9.56	8.64	9.36	8.65	8.05	7.85	7.39	6.98	6.53	6.00	5.59	6.95	7.72	7.12	7.13	6.77	5.70	5.85
44	Median	7.29	8.93	9.27	8.73	9.05	8.57	7.93	7.54	7.12	6.85	6.27	5.80	5.35	7.09	7.76	7.37	7.04	6.71	5.62	5.52

Sources:

[1] The Value Line Investment Survey Investment Analyzer Software, downloaded on June 25, 2019.

[2] The Value Line Investment Survey, July 24, August 14, and September 11, 2020.

[3] The Value Line Investment Survey, January 24, February 14, and March 13, 2020.

Note:

[a] Based on the average of the high and low price and the projected Cash Flow per share.

Arizona Public Service Company

Electric Utilities
(Valuation Metrics)

Line	Company	Market Price to Book Value (MP/BV) Ratio [1]																
		16-Year Average	2020 [2/b]	2019 [3/b]	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
1	ALLETE	1.60	1.43	1.87	1.79	1.78	1.53	1.37	1.42	1.51	1.34	1.35	1.28	1.15	1.55	1.89	2.09	2.22
2	Alliant Energy	1.74	2.15	2.26	2.16	2.38	2.17	1.86	1.86	1.70	1.57	1.46	1.31	1.04	1.33	1.67	1.52	1.33
3	Ameren Corp.	1.49	2.05	2.20	1.95	1.93	1.67	1.46	1.45	1.29	1.18	0.90	0.83	0.78	1.25	1.60	1.62	1.68
4	American Electric Power	1.59	2.05	2.12	1.82	1.88	1.81	1.55	1.54	1.40	1.31	1.23	1.23	1.08	1.48	1.85	1.56	1.57
5	Avangrid, Inc.	0.91	0.94	1.01	1.02	0.93	0.83	0.72	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	Avista Corp.	1.33	1.45	1.55	1.88	1.73	1.57	1.36	1.33	1.25	1.21	1.19	1.07	0.94	1.11	1.29	1.30	1.13
7	Black Hills	1.52	1.67	1.87	1.61	2.06	1.94	1.59	1.79	1.62	1.21	1.14	1.07	0.83	1.22	1.57	1.47	1.63
8	CenterPoint Energy	2.34	1.76	2.13	2.18	2.59	2.73	2.43	2.27	2.30	1.99	1.87	1.96	1.77	2.49	3.13	2.75	3.06
9	CMS Energy Corp.	2.08	2.98	3.20	2.81	2.93	2.72	2.43	2.26	2.09	1.91	1.66	1.48	1.10	1.23	1.82	1.42	1.32
10	Consol. Edison	1.41	1.41	1.57	1.49	1.63	1.58	1.42	1.34	1.38	1.47	1.38	1.22	1.08	1.17	1.47	1.47	1.52
11	Dominion Resources	2.60	2.33	2.19	2.40	2.94	3.15	3.34	3.55	2.97	2.84	2.37	2.01	1.80	2.42	2.69	2.07	2.50
12	DTE Energy	1.49	1.63	1.99	1.91	2.01	1.82	1.65	1.62	1.51	1.35	1.20	1.16	0.89	1.10	1.35	1.29	1.39
13	Duke Energy	1.21	1.30	1.46	1.33	1.41	1.35	1.29	1.28	1.19	1.12	1.11	1.00	0.91	1.06	1.15	N/A	N/A
14	Edison Int'l	1.66	1.57	1.71	1.97	2.17	1.92	1.76	1.68	1.57	1.53	1.24	1.07	1.04	1.56	2.05	1.80	1.93
15	El Paso Electric	1.63	2.09	2.06	1.94	1.87	1.68	1.48	1.52	1.49	1.59	1.64	1.17	0.98	1.33	1.69	1.71	1.76
16	Entergy Corp.	1.75	1.99	2.00	1.74	1.76	1.67	1.40	1.33	1.21	1.31	1.35	1.62	1.66	2.44	2.65	1.89	2.01
17	Eversource Energy	1.48	1.93	1.99	1.68	1.73	1.64	1.53	1.47	1.38	1.28	1.50	1.31	1.12	1.31	1.60	1.22	1.05
18	Evergy, Inc.	1.58	1.54	1.62	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	Exelon Corp.	2.16	1.17	1.42	1.31	1.20	1.20	1.14	1.28	1.17	1.46	1.95	2.07	2.57	4.39	4.79	3.89	3.60
20	FirstEnergy Corp.	2.02	3.13	3.03	2.67	3.53	2.37	1.16	1.15	1.28	1.44	1.33	1.36	1.54	2.52	2.23	1.92	1.64
21	Fortis Inc.	1.46	1.33	1.38	1.24	1.41	1.26	1.33	1.35	1.45	1.59	1.59	1.56	1.33	1.48	1.63	1.96	N/A
22	Great Plains Energy	1.21	N/A	N/A	N/A	1.33	1.17	1.12	1.11	1.02	0.96	0.93	0.87	0.80	1.11	1.66	1.77	1.86
23	Hawaiian Elec.	1.67	2.07	2.02	1.76	1.76	1.63	1.71	1.49	1.54	1.62	1.54	1.44	1.16	1.61	1.57	2.01	1.78
24	IDACORP, Inc.	1.45	1.81	2.08	1.96	1.94	1.76	1.54	1.45	1.33	1.19	1.17	1.13	0.92	1.09	1.26	1.37	1.22
25	MGE Energy	2.10	2.40	2.79	2.59	2.88	2.60	2.10	2.10	2.06	1.92	1.75	1.65	1.54	1.62	1.75	1.83	2.09
26	NextEra Energy, Inc.	2.09	2.95	2.73	2.32	2.35	2.30	2.09	2.15	1.93	1.74	1.55	1.49	1.70	2.06	2.34	1.80	1.93
27	NorthWestern Corp	1.46	1.50	1.67	1.48	1.64	1.68	1.60	1.54	1.56	1.42	1.35	1.22	1.07	1.15	1.48	1.65	1.42
28	OGE Energy	1.85	1.90	2.03	1.75	1.82	1.73	1.79	2.22	2.24	1.94	1.90	1.70	1.37	1.52	1.98	1.91	1.80
29	Otter Tail Corp.	1.85	2.12	2.66	2.49	2.33	1.90	1.78	1.90	1.96	1.58	1.35	1.19	1.18	1.71	1.93	1.76	1.74
30	PG&E Corp.	1.60	N/A	N/A	1.70	1.71	1.69	1.57	1.39	1.38	1.41	1.46	1.56	1.41	1.50	1.94	1.83	1.84
31	Pinnacle West Capital	1.43	1.66	1.90	1.74	1.91	1.72	1.52	1.44	1.47	1.39	1.25	1.14	0.95	1.00	1.26	1.26	1.25
32	PNM Resources	1.28	1.77	2.23	1.83	1.84	1.56	1.33	1.21	1.09	0.98	0.80	0.69	0.56	0.66	1.23	1.21	1.45
33	Portland General	1.35	1.70	1.77	1.56	1.69	1.56	1.42	1.37	1.28	1.14	1.09	0.94	0.92	1.05	1.32	1.36	N/A
34	PPL Corp.	2.09	1.55	1.84	1.81	2.40	2.46	2.24	1.64	1.55	1.58	1.47	1.61	2.10	3.19	3.05	2.43	2.50
35	Public Serv. Enterprise	1.89	1.55	1.92	1.81	1.68	1.67	1.58	1.57	1.44	1.46	1.59	1.67	1.78	2.58	2.99	2.46	2.45
36	SCANA Corp.	1.51	N/A	N/A	N/A	N/A	1.65	1.74	1.47	1.48	1.48	1.36	1.33	1.20	1.45	1.62	1.64	1.72
37	Sempra Energy	1.80	1.73	2.13	2.06	2.24	2.00	2.17	2.20	1.84	1.53	1.28	1.35	1.32	1.60	1.87	1.70	1.73
38	Southern Co.	2.05	2.14	2.05	1.89	2.07	2.01	1.99	2.02	2.04	2.15	1.99	1.83	1.73	2.12	2.24	2.23	2.35
39	Vectren Corp.	1.83	N/A	N/A	N/A	2.75	2.29	2.11	2.08	1.82	1.57	1.53	1.41	1.34	1.64	1.74	1.77	1.82
40	WEC Energy Group	1.97	2.68	2.58	2.11	2.10	2.09	1.82	2.34	2.21	2.05	1.81	1.65	1.40	1.57	1.77	1.71	1.62
41	Westar Energy	1.37	N/A	N/A	N/A	1.94	1.95	1.49	1.44	1.33	1.26	1.20	1.10	0.93	1.10	1.36	1.30	1.41
42	Xcel Energy Inc.	1.63	2.18	2.26	1.97	2.06	1.88	1.66	1.55	1.50	1.51	1.41	1.32	1.19	1.30	1.53	1.40	1.38
43	Average	1.70	1.88	2.03	1.88	2.00	1.85	1.67	1.68	1.60	1.51	1.43	1.35	1.25	1.63	1.90	1.78	1.80
44	Median	1.61	1.77	2.02	1.83	1.91	1.74	1.57	1.53	1.49	1.47	1.37	1.31	1.15	1.48	1.71	1.71	1.73

Sources:

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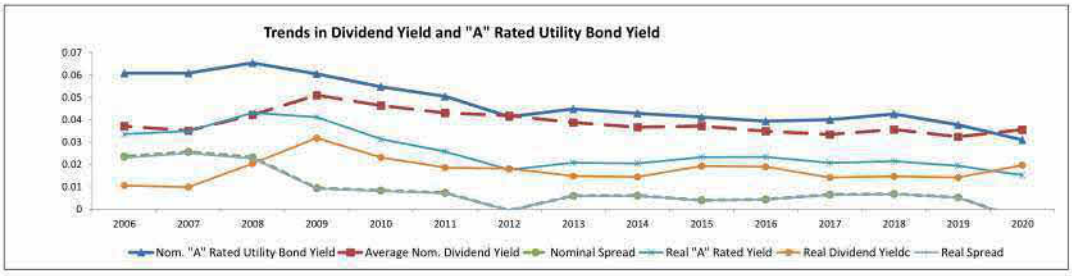
Notes:

[b] Based on the average of the high and low price and the projected Book Value per share.

Arizona Public Service Company

Electric Utilities
(Valuation Metrics)

Line	Company	15-Year Average (1)	2020 [3/a] (2)	2019 [3/a] (3)	2018 (4)	2017 (5)	2016 (6)	2015 (7)	2014 (8)	2013 (9)	2012 (10)	2011 (11)	2010 (12)	2009 (13)	2008 (14)	2007 (15)	2006 (16)
		Dividend Yield[1]															
1	ALLETE	3.93%	3.72%	2.92%	2.99%	2.97%	3.56%	3.97%	3.92%	3.89%	4.49%	4.58%	5.03%	5.79%	4.37%	3.60%	3.16%
2	Alliant Energy	3.71%	3.10%	2.95%	3.20%	3.07%	3.21%	3.60%	3.53%	3.74%	4.07%	4.28%	4.61%	5.73%	4.10%	3.13%	3.32%
3	Ameren Corp.	4.38%	2.75%	2.67%	3.04%	3.12%	3.50%	3.96%	4.02%	4.61%	4.97%	5.28%	5.76%	5.98%	6.21%	4.88%	4.83%
4	American Electric Power	4.04%	3.34%	3.22%	3.60%	3.42%	3.54%	3.80%	3.83%	4.23%	4.58%	4.96%	4.90%	5.50%	4.20%	3.40%	4.06%
5	Avangrid, Inc.	3.77%	3.79%	3.51%	3.49%	3.79%	4.26%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	Avista Corp.	3.74%	3.81%	3.47%	2.93%	3.14%	3.39%	3.97%	3.99%	4.51%	4.55%	4.54%	4.76%	4.49%	3.39%	2.68%	2.52%
7	Black Hills	3.73%	3.21%	2.87%	3.31%	2.75%	2.87%	3.55%	2.84%	3.19%	4.39%	4.64%	4.79%	6.17%	4.21%	3.40%	3.79%
8	CenterPoint Energy	4.42%	3.79%	3.09%	4.09%	4.79%	4.70%	5.06%	3.94%	3.57%	4.04%	4.27%	5.29%	6.37%	4.98%	3.87%	4.39%
9	CMS Energy Corp.	3.24%	2.83%	2.70%	3.03%	2.86%	2.99%	3.36%	3.59%	3.76%	4.16%	4.25%	3.98%	3.97%	2.69%	1.16%	N/A
10	Consol. Edison	4.41%	3.90%	3.52%	3.68%	3.40%	3.62%	4.12%	4.38%	4.25%	4.07%	4.46%	5.16%	5.99%	5.67%	4.84%	5.04%
11	Dominion Resources	4.08%	4.64%	4.85%	4.72%	3.86%	3.82%	3.68%	3.43%	3.78%	4.06%	4.13%	4.41%	5.20%	3.77%	3.32%	3.60%
12	DTE Energy	4.15%	3.98%	3.19%	3.34%	3.15%	3.34%	3.53%	3.54%	3.84%	4.19%	4.68%	4.75%	6.29%	5.24%	4.36%	4.86%
13	Duke Energy	4.73%	4.61%	4.17%	4.54%	4.15%	4.26%	4.34%	4.26%	4.45%	4.68%	5.21%	5.71%	6.25%	5.16%	4.44%	N/A
14	Edison Int'l	3.15%	4.21%	3.82%	3.84%	2.87%	2.81%	2.83%	2.62%	2.85%	2.97%	3.37%	3.66%	3.95%	2.69%	2.21%	2.58%
15	El Paso Electric	2.69%	2.46%	2.48%	2.55%	2.49%	2.75%	3.13%	2.97%	2.99%	2.97%	2.11%	N/A	N/A	N/A	N/A	N/A
16	Entergy Corp.	4.05%	3.55%	3.57%	4.41%	4.49%	4.55%	4.59%	4.47%	5.07%	4.91%	4.85%	4.20%	3.97%	2.92%	2.39%	2.82%
17	Eversource Energy	3.28%	2.84%	2.86%	3.32%	3.14%	3.22%	3.34%	3.40%	3.48%	3.52%	3.23%	3.64%	4.16%	3.25%	2.60%	3.27%
18	Evergy, Inc.	3.31%	3.46%	3.15%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	Exelon Corp.	3.85%	3.83%	3.07%	3.32%	3.51%	3.75%	3.88%	3.69%	4.69%	5.73%	4.96%	4.95%	4.26%	2.78%	2.48%	2.83%
20	FirstEnergy Corp.	4.32%	3.69%	3.58%	5.17%	4.62%	4.31%	4.23%	4.26%	4.26%	4.90%	5.23%	5.76%	5.09%	3.21%	3.12%	3.40%
21	Fortis Inc.	3.69%	3.90%	3.69%	4.07%	3.89%	3.80%	3.76%	3.88%	3.84%	3.64%	3.58%	3.80%	4.21%	3.76%	3.01%	2.79%
22	Great Plains Energy	4.52%	N/A	N/A	N/A	3.58%	3.64%	3.76%	3.62%	3.84%	4.08%	4.15%	4.49%	5.03%	6.98%	5.49%	5.80%
23	Hawaiian Elec.	4.51%	2.98%	3.10%	3.54%	3.65%	3.99%	4.05%	4.76%	4.72%	4.70%	5.04%	5.51%	6.89%	5.00%	5.18%	4.59%
24	IDACORP, Inc.	3.20%	2.99%	2.52%	2.61%	2.58%	2.77%	3.06%	3.12%	3.21%	3.28%	3.10%	3.44%	4.46%	3.95%	3.55%	3.39%
25	MGE Energy	3.13%	2.22%	2.01%	2.16%	1.95%	2.23%	2.78%	2.78%	2.91%	3.25%	3.63%	3.98%	4.36%	4.24%	4.14%	4.25%
26	NextEra Energy, Inc.	3.11%	2.44%	2.42%	2.68%	2.79%	2.91%	3.01%	3.00%	3.30%	3.65%	3.96%	3.90%	3.55%	3.02%	2.65%	3.40%
27	NorthWestern Corp	4.07%	3.82%	3.43%	3.86%	3.52%	3.43%	3.61%	3.30%	3.66%	4.17%	4.51%	4.93%	5.75%	5.38%	4.09%	3.65%
28	OGE Energy	3.68%	4.61%	3.60%	3.98%	3.61%	3.67%	3.51%	2.63%	2.48%	2.94%	3.06%	3.68%	4.96%	4.52%	3.77%	3.99%
29	Otter Tail Corp.	4.10%	3.37%	2.70%	2.92%	3.12%	3.67%	4.33%	4.14%	4.11%	5.21%	5.57%	5.68%	5.36%	3.63%	3.46%	3.92%
30	PG&E Corp.	3.70%	N/A	N/A	N/A	2.42%	3.22%	3.45%	3.96%	4.20%	4.25%	4.24%	4.08%	4.26%	4.01%	3.07%	3.22%
31	Pinnacle West Capital	4.48%	3.69%	3.35%	3.55%	3.16%	3.46%	3.88%	4.09%	3.96%	5.32%	4.81%	5.43%	6.76%	6.17%	4.75%	4.67%
32	PNM Resources	3.24%	2.98%	2.58%	2.79%	2.53%	2.69%	2.90%	2.79%	2.99%	2.96%	3.19%	4.09%	4.76%	4.85%	3.36%	3.21%
33	Portland General	3.65%	3.05%	2.97%	3.27%	2.92%	3.06%	3.27%	3.34%	3.67%	4.11%	4.37%	5.20%	5.36%	4.28%	3.34%	2.54%
34	PPL Corp.	4.54%	6.05%	5.15%	5.61%	4.24%	4.25%	4.55%	4.45%	4.81%	5.07%	5.10%	5.12%	4.51%	3.10%	2.69%	3.41%
35	Public Serv. Enterprise	3.82%	4.05%	3.30%	3.49%	3.74%	3.78%	3.81%	3.92%	4.35%	4.55%	4.24%	4.30%	4.30%	3.26%	2.73%	3.47%
36	SCANA Corp.	4.37%	N/A	N/A	N/A	4.03%	3.29%	3.90%	4.05%	4.15%	4.25%	4.78%	4.93%	5.87%	4.92%	4.29%	4.21%
37	Sempra Energy	2.97%	3.35%	2.97%	3.20%	2.92%	2.92%	2.71%	2.61%	3.03%	3.71%	3.65%	3.08%	3.23%	2.62%	2.08%	2.47%
38	Southern Co.	4.70%	4.49%	4.57%	5.27%	4.63%	4.42%	4.78%	4.69%	4.61%	4.29%	4.63%	5.13%	5.52%	4.58%	4.39%	4.52%
39	Vectren Corp.	4.36%	N/A	N/A	N/A	2.79%	3.31%	3.60%	3.62%	4.15%	4.82%	5.06%	5.53%	5.85%	4.79%	4.53%	4.52%
40	WEC Energy Group	3.04%	2.85%	2.85%	3.38%	3.31%	3.35%	3.49%	3.40%	3.49%	3.24%	3.35%	2.97%	3.16%	2.41%	2.14%	2.16%
41	Westar Energy	4.37%	N/A	N/A	N/A	3.00%	2.90%	3.73%	3.88%	4.27%	4.57%	4.84%	5.32%	6.27%	5.22%	4.16%	4.28%
42	Xcel Energy Inc.	3.85%	2.90%	2.85%	3.25%	3.10%	3.33%	3.69%	3.83%	3.86%	3.90%	4.20%	4.54%	5.14%	4.70%	4.05%	4.40%
43	**Average**	**3.87%**	**3.55%**	**3.23%**	**3.56%**	**3.34%**	**3.49%**	**3.71%**	**3.66%**	**3.87%**	**4.18%**	**4.30%**	**4.63%**	**5.09%**	**4.21%**	**3.51%**	**3.71%**
44	Median	3.84%	3.55%	3.10%	3.36%	3.15%	3.43%	3.71%	3.76%	3.85%	4.18%	4.42%	4.76%	5.14%	4.21%	3.40%	3.60%
		0.61%															
45	20-Yr Treasury Yields[4]	3.26%	1.35%	2.40%	3.02%	2.65%	2.23%	2.55%	3.07%	3.12%	2.54%	3.62%	4.03%	4.11%	4.36%	4.91%	4.99%
46	20-Yr TIPS[4]	1.16%	-0.20%	0.60%	0.94%	0.76%	0.66%	0.78%	0.87%	0.75%	0.21%	1.19%	1.73%	2.21%	2.19%	2.36%	2.31%
47	Implied Inflation[b]	2.08%	1.55%	1.79%	2.06%	1.89%	1.56%	1.75%	2.19%	2.35%	2.33%	2.40%	2.26%	1.85%	2.13%	2.49%	2.62%
48	**Real Dividend Yield[c]**	**1.75%**	**1.97%**	**1.42%**	**1.47%**	**1.42%**	**1.90%**	**1.93%**	**1.44%**	**1.49%**	**1.81%**	**1.86%**	**2.32%**	**3.18%**	**2.04%**	**0.99%**	**1.06%**
	A-Rated Utility																
49	**Nominal "A" Rated Yield[5]**	**4.75%**	**3.10%**	**3.77%**	**4.25%**	**4.00%**	**3.93%**	**4.12%**	**4.28%**	**4.48%**	**4.13%**	**5.04%**	**5.46%**	**6.04%**	**6.53%**	**6.07%**	**6.07%**
50	**Real "A" Rated Yield**	**2.61%**	**1.52%**	**1.94%**	**2.14%**	**2.07%**	**2.34%**	**2.33%**	**2.04%**	**2.08%**	**1.76%**	**2.58%**	**3.13%**	**4.11%**	**4.31%**	**3.49%**	**3.36%**
	Baa-Rated Utility																
51	**Nominal "Baa" Rated Yield**	**5.31%**	**3.66%**	**4.19%**	**4.67%**	**4.38%**	**4.67%**	**5.03%**	**4.80%**	**4.98%**	**4.83%**	**5.57%**	**5.96%**	**7.06%**	**7.25%**	**6.33%**	**6.32%**
52	**Real "Baa" Rated Yield**	**3.16%**	**2.08%**	**2.36%**	**2.55%**	**2.44%**	**3.07%**	**3.22%**	**2.55%**	**2.57%**	**2.44%**	**3.09%**	**3.62%**	**5.11%**	**5.01%**	**3.74%**	**3.60%**
	Spreads (A-Rated Utility Bond - Stock)																
53	**Nominal Spread[d]**	**0.88%**	**-0.45%**	**0.53%**	**0.69%**	**0.66%**	**0.44%**	**0.40%**	**0.61%**	**0.61%**	**-0.05%**	**0.74%**	**0.84%**	**0.95%**	**2.32%**	**2.57%**	**2.36%**
54	**Real Spread[e]**	**0.86%**	**-0.45%**	**0.52%**	**0.68%**	**0.65%**	**0.44%**	**0.40%**	**0.60%**	**0.59%**	**-0.05%**	**0.72%**	**0.82%**	**0.93%**	**2.27%**	**2.50%**	**2.30%**
	Spreads (Baa-Rated Utility Bond - Stock)																
55	**Nominal Spread[f]**	**1.44%**	**0.11%**	**0.96%**	**1.11%**	**1.04%**	**1.19%**	**1.31%**	**1.14%**	**1.11%**	**0.65%**	**1.26%**	**1.34%**	**1.96%**	**3.03%**	**2.82%**	**2.61%**
56	**Real Spread[g]**	**1.41%**	**0.11%**	**0.94%**	**1.09%**	**1.02%**	**1.17%**	**1.29%**	**1.11%**	**1.09%**	**0.63%**	**1.23%**	**1.31%**	**1.93%**	**2.97%**	**2.75%**	**2.54%**
	Spreads (Treasury Bond - Stock)																
57	**Nominal[f]**	**-0.61%**	**-2.20%**	**-0.83%**	**-0.54%**	**-0.69%**	**-1.26%**	**-1.17%**	**-0.59%**	**-0.75%**	**-1.64%**	**-0.68%**	**-0.60%**	**-0.98%**	**0.15%**	**1.40%**	**1.28%**
58	**Real[g]**	**-0.60%**	**-2.17%**	**-0.82%**	**-0.53%**	**-0.68%**	**-1.24%**	**-1.15%**	**-0.58%**	**-0.73%**	**-1.60%**	**-0.67%**	**-0.58%**	**-0.97%**	**0.15%**	**1.37%**	**1.25%**



Sources:
[1] The Value Line Investment Survey Investment Analyzer Software, downloaded on June 25, 2019.
[2] The Value Line Investment Survey, July 24, August 14, and September 11, 2020.
[3] The Value Line Investment Survey, January 24, February 14, and March 13, 2020.
[4] St. Louis Federal Reserve: Economic Research, http://research.stlouisfed.org.
[5] www.moodys.com, Bond Yields and Key Indicators, through August 31, 2020.

Notes:
[a] Based on the average of the high and low price and the projected Dividends Declared per share, published in the Value Line Investment Survey.
[b] Line 47 = (1 + Line 45) / (1 + Line 46) - 1.
[c] Line 48 = (1 + Line 43) / (1 +Line 47) - 1.
[d] The spread being measured here is the nominal A-rated utility bond yield over the average nominal utility dividend yield; (Line 49 - Line 43).
[e] The spread being measured here is the real A-rated utility bond yield over the average real utility dividend yield; Line 50 - Line 48)
[f] The spread being measured here is the nominal 20-Year Treasury yield over the average nominal utility dividend yield; (Line 45 - Line 43).
[g] The spread being measured here is the real 20-Year TIPS yield over the average real utility dividend yield; Line 48 - Line 46)

Arizona Public Service Company

Electric Utilities
(Valuation Metrics)

Line	Company	15-Year Average (1)	2020 [2] (2)	2019 [3] (3)	2018 (4)	2017 (5)	2016 (6)	2015 (7)	2014 (8)	2013 (9)	2012 (10)	2011 (11)	2010 (12)	2009 (13)	2008 (14)	2007 (15)	2006 (16)
		Dividend per Share[1]															
1	ALLETE	1.94	2.47	2.35	2.24	2.14	2.08	2.02	1.96	1.90	1.84	1.78	1.76	1.76	1.72	1.64	1.45
2	Alliant Energy	1.00	1.52	1.42	1.34	1.26	1.18	1.10	1.02	0.94	0.90	0.85	0.79	0.75	0.70	0.64	0.58
3	Ameren Corp.	1.87	2.01	1.92	1.85	1.78	1.72	1.66	1.61	1.60	1.60	1.56	1.54	1.54	2.54	2.54	2.54
4	American Electric Power	2.04	2.84	2.71	2.53	2.39	2.27	2.15	2.03	1.95	1.88	1.85	1.71	1.64	1.64	1.58	1.50
5	Avangrid, Inc.	1.74	1.76	1.76	1.74	1.73	1.73	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	Avista Corp.	1.15	1.62	1.55	1.49	1.43	1.37	1.32	1.27	1.22	1.16	1.10	1.00	0.81	0.69	0.60	0.57
7	Black Hills	1.62	2.17	2.05	1.93	1.81	1.68	1.62	1.56	1.52	1.48	1.46	1.44	1.42	1.40	1.37	1.32
8	CenterPoint Energy	0.87	0.74	0.86	1.12	1.35	1.03	0.99	0.95	0.83	0.81	0.79	0.78	0.76	0.73	0.68	0.60
9	CMS Energy Corp.	1.00	1.63	1.53	1.43	1.33	1.24	1.16	1.08	1.02	0.96	0.84	0.66	0.50	0.36	0.20	N/A
10	Consol. Edison	2.56	3.06	2.96	2.86	2.76	2.68	2.60	2.52	2.46	2.42	2.40	2.38	2.36	2.34	2.32	2.30
11	Dominion Resources	2.37	3.45	3.67	3.34	3.04	2.80	2.59	2.40	2.25	2.11	1.97	1.83	1.75	1.58	1.46	1.38
12	DTE Energy	2.76	4.12	3.85	3.59	3.36	3.06	2.84	2.69	2.59	2.42	2.32	2.18	2.12	2.12	2.12	2.08
13	Duke Energy	3.18	3.82	3.75	3.64	3.49	3.36	3.24	3.15	3.09	3.03	2.97	2.91	2.82	2.70	2.58	N/A
14	Edison Int'l	1.66	2.58	2.48	2.43	2.23	1.98	1.73	1.48	1.37	1.31	1.29	1.27	1.25	1.23	1.18	1.10
15	El Paso Electric	1.20	1.62	1.52	1.42	1.32	1.23	1.17	1.11	1.05	0.97	0.66	N/A	N/A	N/A	N/A	N/A
16	Entergy Corp.	3.23	3.74	3.66	3.58	3.50	3.42	3.34	3.32	3.32	3.32	3.32	3.24	3.00	3.00	2.58	2.16
17	Eversource Energy	1.44	2.27	2.14	2.02	1.90	1.78	1.67	1.57	1.47	1.32	1.10	1.03	0.95	0.83	0.78	0.73
18	Evergy, Inc.	1.99	2.05	1.93	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	Exelon Corp.	1.65	1.53	1.45	1.38	1.31	1.26	1.24	1.24	1.46	2.10	2.10	2.10	2.10	2.05	1.82	1.64
20	FirstEnergy Corp.	1.81	1.56	1.53	1.82	1.44	1.44	1.44	1.44	1.65	2.20	2.20	2.20	2.20	2.20	2.05	1.85
21	Fortis Inc.	1.32	1.97	1.86	1.75	1.65	1.55	1.43	1.30	1.25	1.21	1.17	1.12	1.04	1.00	0.82	0.67
22	Great Plains Energy	1.11	N/A	N/A	N/A	1.10	1.06	1.00	0.94	0.88	0.86	0.84	0.83	0.83	1.66	1.66	1.66
23	Hawaiian Elec.	1.25	1.32	1.28	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24
24	IDACORP, Inc.	1.72	2.73	2.56	2.40	2.24	2.08	1.92	1.76	1.57	1.37	1.20	1.20	1.20	1.20	1.20	1.20
25	MGE Energy	1.12	1.45	1.38	1.32	1.26	1.21	1.16	1.11	1.07	1.04	1.01	0.99	0.97	0.96	0.94	0.93
26	NextEra Energy, Inc.	2.97	5.60	5.00	4.44	3.93	3.48	3.08	2.90	2.64	2.40	2.20	2.00	1.89	1.78	1.64	1.50
27	NorthWestern Corp.	1.70	2.40	2.30	2.20	2.10	2.00	1.92	1.60	1.52	1.48	1.44	1.36	1.34	1.32	1.28	1.24
28	OGE Energy	0.99	1.60	1.51	1.40	1.27	1.16	1.05	0.95	0.85	0.80	0.76	0.73	0.71	0.70	0.68	0.67
29	Otter Tail Corp.	1.24	1.48	1.40	1.34	1.28	1.25	1.23	1.21	1.19	1.19	1.19	1.19	1.19	1.19	1.17	1.15
30	PG&E Corp.	1.70	N/A	N/A	N/A	1.55	1.93	1.82	1.82	1.82	1.82	1.82	1.82	1.68	1.56	1.44	1.32
31	Pinnacle West Capital	2.44	3.22	3.04	2.87	2.70	2.56	2.44	2.33	2.23	2.67	2.10	2.10	2.10	2.10	2.10	2.03
32	PNM Resources	0.80	1.24	1.18	1.09	0.99	0.88	0.80	0.76	0.68	0.58	0.50	0.50	0.50	0.61	0.91	0.86
33	Portland General	1.15	1.54	1.52	1.43	1.34	1.26	1.18	1.12	1.10	1.08	1.06	1.04	1.01	0.97	0.93	0.68
34	PPL Corp.	1.45	1.66	1.65	1.64	1.58	1.52	1.50	1.49	1.47	1.44	1.40	1.40	1.38	1.34	1.22	1.10
35	Public Serv. Enterprise	1.50	1.96	1.88	1.80	1.72	1.64	1.56	1.48	1.44	1.42	1.37	1.37	1.33	1.29	1.17	1.14
36	SCANA Corp.	2.00	N/A	N/A	N/A	2.45	2.30	2.18	2.10	2.03	1.98	1.94	1.90	1.88	1.84	1.76	1.68
37	Sempra Energy	2.48	4.18	3.87	3.58	3.29	3.02	2.80	2.64	2.52	2.40	1.92	1.56	1.56	1.37	1.24	1.20
38	Southern Co.	2.02	2.54	2.46	2.38	2.30	2.22	2.15	2.08	2.01	1.94	1.87	1.80	1.73	1.66	1.60	1.54
39	Vectren Corp.	1.42	N/A	N/A	N/A	1.71	1.62	1.54	1.46	1.43	1.41	1.39	1.37	1.35	1.31	1.27	1.23
40	WEC Energy Group	1.41	2.53	2.36	2.21	2.08	1.98	1.74	1.56	1.45	1.20	1.04	0.80	0.68	0.54	0.50	0.46
41	Westar Energy	1.30	N/A	N/A	N/A	1.60	1.52	1.44	1.40	1.36	1.32	1.28	1.24	1.20	1.16	1.08	0.98
42	Xcel Energy Inc.	1.20	1.72	1.62	1.52	1.44	1.36	1.28	1.20	1.11	1.07	1.03	1.00	0.97	0.94	0.91	0.88
43	**Average**	**1.70**	**2.32**	**2.22**	**2.12**	**1.97**	**1.86**	**1.76**	**1.67**	**1.61**	**1.59**	**1.51**	**1.47**	**1.42**	**1.42**	**1.36**	**1.27**
44	**Industry Average Growth**	**4.38%**	**4.56%**	**4.46%**	**7.61%**	**6.14%**	**5.60%**	**5.24%**	**3.58%**	**1.23%**	**5.69%**	**2.49%**	**3.36%**	**-0.08%**	**5.06%**	**6.45%**	

Sources:
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[2] The Value Line Investment Survey, July 24, August 14, and September 11, 2020.
[3] The Value Line Investment Survey, January 24, February 14, and March 13, 2020.

Notes:
PG&E is excluded from 2017, 2018 and 2019 average calculations due to their Dividend Suspension.

Arizona Public Service Company

Electric Utilities
(Valuation Metrics)

Line	Company	Earnings per Share[1] 15-Year Average (1)	2020 [2] (2)	2019 [3] (3)	2018 (4)	2017 (5)	2016 (6)	2015 (7)	2014 (8)	2013 (9)	2012 (10)	2011 (11)	2010 (12)	2009 (13)	2008 (14)	2007 (15)	2006 (16)
1	ALLETE	2.86	3.10	3.33	3.38	3.13	3.14	3.38	2.90	2.63	2.58	2.65	2.19	1.89	2.82	3.08	2.77
2	Alliant Energy	1.64	2.45	2.33	2.19	1.99	1.65	1.69	1.74	1.65	1.53	1.38	1.38	0.95	1.27	1.35	1.03
3	Ameren Corp.	2.76	3.50	3.35	3.32	2.77	2.68	2.38	2.40	2.10	2.41	2.47	2.77	2.78	2.88	2.98	2.66
4	American Electric Power	3.37	4.25	4.08	3.90	3.62	4.23	3.59	3.34	3.18	2.98	3.13	2.60	2.97	2.99	2.86	2.86
5	Avangrid, Inc.	1.80	1.95	2.40	1.92	1.67	1.98	0.86	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	Avista Corp.	1.75	1.85	2.90	2.07	1.95	2.15	1.89	1.84	1.85	1.32	1.72	1.65	1.58	1.36	0.72	1.47
7	Black Hills	2.46	3.55	3.45	3.47	3.38	2.63	2.83	2.89	2.61	1.97	1.01	1.66	2.32	0.18	2.68	2.21
8	CenterPoint Energy	1.22	1.30	1.49	0.74	1.57	1.00	1.08	1.42	1.24	1.35	1.27	1.07	1.01	1.30	1.17	1.33
9	CMS Energy Corp.	1.63	2.60	2.39	2.32	2.17	1.98	1.89	1.74	1.66	1.53	1.45	1.33	0.93	1.23	0.64	0.64
10	Consol. Edison	3.73	3.95	3.95	4.55	4.10	3.94	4.05	3.62	3.93	3.86	3.57	3.47	3.14	3.36	3.48	2.95
11	Dominion Resources	2.89	3.05	2.15	3.25	3.53	3.44	3.20	3.05	3.09	2.75	2.76	2.89	2.64	3.04	2.13	2.40
12	DTE Energy	4.36	6.70	6.31	6.17	5.73	4.83	4.44	5.10	3.76	3.88	3.67	3.74	3.24	2.73	2.66	2.45
13	Duke Energy	3.94	5.10	5.05	4.13	4.22	3.71	4.10	4.13	3.98	3.71	4.14	4.02	3.39	3.03	3.60	2.73
14	Edison Int'l	3.52	4.10	4.65	-1.26	4.51	3.94	4.15	4.33	3.78	4.55	3.23	3.35	3.24	3.68	3.32	3.28
15	El Paso Electric	2.07	2.00	2.70	2.07	2.42	2.39	2.03	2.27	2.20	2.26	2.48	2.07	1.50	1.73	1.63	1.27
16	Entergy Corp.	5.97	5.00	6.30	5.88	5.19	6.88	5.81	5.77	4.96	6.02	7.55	6.66	6.30	6.20	5.60	5.36
17	Eversource Energy	2.44	3.60	3.45	3.25	3.11	2.96	2.76	2.58	2.49	1.89	2.22	2.10	1.91	1.86	1.59	0.82
18	Evergy, Inc.	2.77	2.75	2.79	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	Exelon Corp.	2.98	2.70	3.00	2.07	2.78	1.80	2.54	2.10	2.31	1.92	3.75	3.87	4.29	4.10	4.03	3.50
20	FirstEnergy Corp.	2.59	1.95	1.85	1.33	2.73	2.10	2.00	0.85	2.97	2.13	1.88	3.25	3.32	4.38	4.22	3.82
21	Fortis Inc.	1.87	2.50	2.68	2.52	2.66	1.89	2.11	1.38	1.63	1.65	1.74	1.62	1.51	1.52	1.29	1.36
22	Great Plains Energy	1.33	N/A	N/A	N/A	-0.06	1.61	1.37	1.57	1.62	1.35	1.25	1.53	1.03	1.16	1.85	1.62
23	Hawaiian Elec.	1.52	1.65	1.90	1.85	1.64	2.29	1.50	1.64	1.62	1.67	1.44	1.21	0.91	1.07	1.11	1.33
24	IDACORP, Inc.	3.45	4.55	4.45	4.49	4.21	3.94	3.87	3.85	3.64	3.37	3.36	2.95	2.64	2.18	1.86	2.35
25	MGE Energy	1.98	2.65	2.51	2.43	2.20	2.18	2.06	2.32	2.16	1.86	1.76	1.67	1.47	1.59	1.51	1.37
26	NextEra Energy, Inc.	5.30	7.65	7.76	6.67	6.50	5.78	6.06	5.60	4.83	4.56	4.82	4.74	3.97	4.07	3.27	3.23
27	NorthWestern Corp	2.59	3.30	3.55	3.40	3.34	3.39	2.90	2.99	2.46	2.26	2.53	2.14	2.02	1.77	1.44	1.31
28	OGE Energy	1.72	2.10	2.24	2.12	1.92	1.69	1.69	1.98	1.94	1.79	1.73	1.50	1.33	1.25	1.32	1.23
29	Otter Tail Corp.	1.43	2.15	2.17	2.06	1.86	1.60	1.56	1.55	1.37	1.05	0.45	0.38	0.71	1.09	1.78	1.69
30	PG&E Corp.	1.49	N/A	N/A	-13.25	3.50	2.83	2.00	3.06	1.83	2.07	2.78	2.82	3.03	3.22	2.78	2.76
31	Pinnacle West Capital	3.56	4.75	4.50	4.54	4.43	3.95	3.92	3.58	3.66	3.50	2.99	3.08	2.26	2.12	2.96	3.17
32	PNM Resources	1.35	1.90	2.20	1.66	1.92	1.65	1.64	1.45	1.41	1.31	1.08	0.87	0.58	0.11	0.76	1.72
33	Portland General	1.94	2.30	2.40	2.37	2.29	2.16	2.04	2.18	1.77	1.87	1.95	1.66	1.31	1.39	2.33	1.14
34	PPL Corp.	2.37	2.40	2.40	2.58	2.11	2.79	2.37	2.38	2.38	2.61	2.61	2.29	1.19	2.45	2.63	2.29
35	Public Serv. Enterprise	2.89	3.40	3.70	2.76	2.82	2.83	3.30	2.99	2.45	2.44	3.11	3.07	3.08	2.90	2.59	1.85
36	SCANA Corp.	3.30	N/A	N/A	N/A	4.20	4.16	3.81	3.79	3.39	3.15	2.97	2.98	2.85	2.95	2.74	2.59
37	Sempra Energy	4.80	7.20	5.85	5.48	4.63	4.24	5.23	4.63	4.22	4.35	4.47	4.02	4.78	4.43	4.26	4.23
38	Southern Co.	2.67	3.10	3.10	3.00	3.21	2.83	2.84	2.77	2.70	2.67	2.55	2.36	2.32	2.25	2.28	2.10
39	Vectren Corp.	1.94	N/A	N/A	N/A	2.60	2.55	2.39	2.02	1.66	1.94	1.73	1.64	1.79	1.63	1.83	1.44
40	WEC Energy Group	2.43	3.75	3.58	3.34	3.14	2.96	2.34	2.59	2.51	2.35	2.18	1.92	1.60	1.52	1.42	1.32
41	Westar Energy	1.96	N/A	N/A	N/A	2.27	2.43	2.09	2.35	2.27	2.15	1.79	1.80	1.28	1.31	1.84	1.88
42	Xcel Energy Inc.	1.94	2.75	2.60	2.47	2.30	2.21	2.10	2.03	1.91	1.85	1.72	1.56	1.49	1.46	1.35	1.35
43	**Average**	**2.69**	**3.34**	**3.39**	**3.01**	**3.02**	**2.91**	**2.78**	**2.77**	**2.60**	**2.51**	**2.53**	**2.45**	**2.26**	**2.29**	**2.32**	**2.17**
44	**Industry Average Growth**	**3.20%**	**-1.56%**	**12.56%**	**-0.18%**	**3.68%**	**4.86%**	**0.28%**	**6.70%**	**3.34%**	**-0.86%**	**3.54%**	**8.08%**	**-1.11%**	**-1.47%**	**6.98%**	

Sources:
[1] The Value Line Investment Survey Investment Analyzer Software, downloaded on June 25, 2019.
[2] The Value Line Investment Survey, July 24, August 14, and September 11, 2020.
[3] The Value Line Investment Survey, January 24, February 14, and March 13, 2020.
Notes:
PG&E is excluded from 2017, 2018, and 2019 average calculations due to their Dividend Suspension.

Arizona Public Service Company

Electric Utilities
(Valuation Metrics)

Line	Company	Cash Flow / Capital Spending 2019 (1)	2020 (2)	2021 (3)	3 - 5 yr Projection (4)
1	ALLETE	0.63x	0.74x	0.69x	2.85x
2	Alliant Energy	0.73x	0.82x	0.83x	0.85x
3	Ameren Corp.	0.79x	0.51x	0.75x	0.98x
4	American Electric Power	0.75x	0.74x	0.62x	0.96x
5	Avangrid, Inc.	0.70x	0.56x	0.55x	0.67x
6	Avista Corp.	0.89x	0.85x	0.87x	1.00x
7	Black Hills	0.51x	0.72x	0.87x	1.21x
8	CenterPoint Energy	0.83x	0.88x	0.80x	0.94x
9	CMS Energy Corp.	0.79x	0.82x	0.67x	0.89x
10	Consol. Edison	0.79x	0.82x	0.86x	1.00x
11	Dominion Resources	0.81x	1.00x	0.87x	1.03x
12	DTE Energy	0.83x	0.67x	0.83x	1.33x
13	Duke Energy	0.78x	0.86x	0.87x	1.05x
14	Edison Int'l	0.69x	0.67x	0.76x	0.89x
15	El Paso Electric	0.96x	1.00x	0.83x	0.86x
16	Entergy Corp.	0.79x	0.81x	0.95x	1.12x
17	Eversource Energy	0.78x	0.95x	0.89x	1.06x
18	Evergy, Inc.	1.34x	1.06x	1.01x	1.38x
19	Exelon Corp.	1.18x	1.30x	1.31x	1.47x
20	FirstEnergy Corp.	0.74x	0.96x	0.86x	1.00x
21	Fortis Inc.	0.68x	0.60x	0.74x	1.04x
22	Hawaiian Elec.	1.12x	1.10x	1.06x	1.11x
23	IDACORP, Inc.	1.25x	1.25x	1.22x	1.39x
24	MGE Energy	0.97x	0.73x	1.13x	1.22x
25	NextEra Energy, Inc.	0.67x	0.73x	0.75x	0.92x
26	NorthWestern Corp	1.07x	0.98x	0.91x	1.33x
27	OGE Energy	1.26x	1.43x	1.19x	1.33x
28	Otter Tail Corp.	0.80x	0.45x	1.16x	1.75x
29	Pinnacle West Capital	0.98x	0.98x	0.79x	1.19x
30	PNM Resources	0.72x	0.59x	0.53x	1.21x
31	Portland General	0.99x	0.75x	1.17x	1.50x
32	PPL Corp.	0.92x	1.06x	1.06x	1.54x
33	Public Serv. Enterprise	1.07x	1.00x	1.27x	1.43x
34	Sempra Energy	0.66x	0.92x	0.81x	1.31x
35	Southern Co.	0.88x	1.01x	0.90x	1.19x
36	WEC Energy Group	0.91x	0.70x	0.74x	1.16x
37	Xcel Energy Inc.	0.69x	0.99x	1.00x	1.00x
38	Average	0.86x	0.87x	0.89x	1.19x
39	Median	0.80x	0.85x	0.87x	1.12x

Sources:
The Value Line Investment Survey Investment Analyzer Software, downloaded on June 25, 2019.
The Value Line Investment Survey, July 24, August 14, and September 11, 2020.
The Value Line Investment Survey, January 24, February 14, and March 13, 2020.

Notes:
Based on the projected Cash Flow per share and Capital Spending per share.

Arizona Public Service Company

Proxy Group

Line	Company	Credit Ratings[1] S&P (1)	Credit Ratings[1] Moody's (2)	Common Equity Ratios MI[1] (3)	Common Equity Ratios Value Line[2] (4)
1	ALLETE, Inc.	BBB	Baa1	56.1%	61.4%
2	Ameren Corporation	BBB+	Baa1	44.7%	47.1%
3	American Electric Power Company, Inc.	A-	Baa2	38.6%	43.9%
4	DTE Energy Company	BBB+	Baa2	39.6%	42.3%
5	Duke Energy Corporation	A-	Baa1	40.5%	44.1%
6	Exelon Corporation	BBB+	Baa2	43.6%	50.4%
7	Evergy, Inc.	A-	Baa2	46.0%	49.4%
8	FirstEnergy Corp.	BBB	Baa3	24.7%	26.2%
9	OGE Energy Corp.	BBB+	Baa1	55.2%	56.4%
10	Otter Tail Corporation	BBB	Baa2	52.1%	53.1%
11	PNM Resources, Inc.	BBB	Baa3	33.0%	39.9%
12	PPL Corporation	A-	Baa2	35.9%	38.5%
13	Southern Company	A-	Baa2	34.1%	39.5%
14	Xcel Energy Inc.	A-	Baa1	39.2%	43.2%
15	**Average**	**BBB+**	**Baa2**	**41.7%**	**45.4%**
16	**Median**			**40.1%**	**44.0%**
17	**Arizona Public Service Company**	**A-[3]**	**A2[3]**		**54.67%[4]**

Sources:

[1] S&P Global Market Intelligence, Downloaded on September 21, 2020.

[2] *The Value Line Investment Survey*, July 24, August 14, and September 11, 2020.

[3] Bulkley direct at 31.

[4] Bulkley direct at 60.

Arizona Public Service Company

Consensus Analysts' Growth Rates

Line	Company	Zacks Estimated Growth %[1] (1)	Zacks Number of Estimates (2)	MI Estimated Growth %[2] (3)	MI Number of Estimates (4)	Yahoo! Finance Estimated Growth %[3] (5)	Yahoo! Finance Number of Estimates (6)	Average of Growth Rates (7)
1	ALLETE, Inc.	N/A	N/A	6.05%	4	7.00%	6	6.53%
2	Ameren Corporation	6.80%	N/A	6.09%	5	5.85%	14	6.25%
3	American Electric Power Company, Inc.	5.60%	N/A	6.08%	8	5.63%	16	5.77%
4	DTE Energy Company	5.70%	N/A	6.00%	5	5.95%	19	5.88%
5	Duke Energy Corporation	4.30%	N/A	4.72%	5	2.80%	13	3.94%
6	Exelon Corporation	4.00%	N/A	3.41%	5	- 3.48%	18	3.71%
7	Evergy, Inc.	6.40%	N/A	6.61%	3	6.80%	8	6.60%
8	FirstEnergy Corp.	N/A	N/A	5.64%	6	- 2.40%	16	5.64%
9	OGE Energy Corp.	3.70%	N/A	4.15%	4	2.40%	10	3.42%
10	Otter Tail Corporation	N/A	N/A	6.55%	2	9.00%	4	7.78%
11	PNM Resources, Inc.	4.90%	N/A	5.34%	4	4.95%	9	5.06%
12	PPL Corporation	N/A	N/A	3.00%	3	-16.20%	10	3.00%
13	Southern Company	4.00%	N/A	4.43%	4	4.55%	18	4.33%
14	Xcel Energy Inc.	5.90%	N/A	5.79%	5	6.10%	15	5.93%
15	**Average**	**5.13%**	**N/A**	**5.28%**	**5**	**5.55%**	**13**	**5.27%**
16	**Median**							**5.71%**

Sources:

[1] Zacks, http://www.zacks.com/, downloaded on September 18, 2020.

[2] S&P Global Market Intelligence, https://platform.mi.spglobal.com, downloaded on September 18, 2020.

[3] Yahoo! Finance, http://www.finance.yahoo.com/, downloaded on September 18, 2020.

Note:

Yahoo! Finance next year number of estimates.

Negative growth rates excluded from averages.

Arizona Public Service Company

Constant Growth DCF Model
(Consensus Analysts' Growth Rates)

Line	Company	13-Week AVG Stock Price[1] (1)	Analysts' Growth[2] (2)	Annualized Dividend[3] (3)	Adjusted Yield (4)	Constant Growth DCF (5)
1	ALLETE, Inc.	$55.99	6.53%	$2.47	4.70%	11.22%
2	Ameren Corporation	$77.48	6.25%	$1.98	2.72%	8.96%
3	American Electric Power Company, Inc.	$82.16	5.77%	$2.80	3.60%	9.37%
4	DTE Energy Company	$113.90	5.88%	$4.05	3.76%	9.65%
5	Duke Energy Corporation	$82.11	3.94%	$3.86	4.89%	8.83%
6	Exelon Corporation	$37.25	3.71%	$1.53	4.26%	7.96%
7	Evergy, Inc.	$57.20	6.60%	$2.02	3.76%	10.37%
8	FirstEnergy Corp.	$32.61	5.64%	$1.56	5.05%	10.69%
9	OGE Energy Corp.	$31.60	3.42%	$1.55	5.07%	8.49%
10	Otter Tail Corporation	$38.77	7.78%	$1.48	4.11%	11.89%
11	PNM Resources, Inc.	$41.42	5.06%	$1.23	3.12%	8.18%
12	PPL Corporation	$26.88	3.00%	$1.66	6.36%	9.36%
13	Southern Company	$53.29	4.33%	$2.56	5.01%	9.34%
14	Xcel Energy Inc.	$67.78	5.93%	$1.72	2.69%	8.62%
15	**Average**	**$57.03**	**5.27%**	**$2.18**	**4.22%**	**9.50%**
16	**Median**					**9.35%**

Sources:
[1] S&P Global Market Intelligence, Downloaded on September 21, 2020.
[2] Attachment CCW-4DR.
[3] *The Value Line Investment Survey*, July 24, August 14, and September 11, 2020.

Arizona Public Service Company

Constant Growth DCF Model
(Consensus Analysts' Growth Rates)

Line	Company	26-Week AVG Stock Price[1] (1)	Analysts' Growth[2] (2)	Annualized Dividend[3] (3)	Adjusted Yield (4)	Constant Growth DCF (5)
1	ALLETE, Inc.	$56.68	6.53%	$2.47	4.64%	11.17%
2	Ameren Corporation	$75.10	6.25%	$1.98	2.80%	9.05%
3	American Electric Power Company, Inc.	$81.91	5.77%	$2.80	3.62%	9.39%
4	DTE Energy Company	$108.15	5.88%	$4.05	3.97%	9.85%
5	Duke Energy Corporation	$83.14	3.94%	$3.86	4.83%	8.77%
6	Exelon Corporation	$37.15	3.71%	$1.53	4.27%	7.98%
7	Evergy, Inc.	$57.90	6.60%	$2.02	3.72%	10.32%
8	FirstEnergy Corp.	$36.90	5.64%	$1.56	4.47%	10.11%
9	OGE Energy Corp.	$31.22	3.42%	$1.55	5.13%	8.55%
10	Otter Tail Corporation	$40.61	7.78%	$1.48	3.93%	11.70%
11	PNM Resources, Inc.	$40.63	5.06%	$1.23	3.18%	8.24%
12	PPL Corporation	$26.33	3.00%	$1.66	6.49%	9.49%
13	Southern Company	$54.48	4.33%	$2.56	4.90%	9.23%
14	Xcel Energy Inc.	$64.98	5.93%	$1.72	2.80%	8.73%
15	**Average**	**$56.80**	**5.27%**	**$2.18**	**4.20%**	**9.47%**
16	**Median**					**9.31%**

Sources:
[1] S&P Global Market Intelligence, Downloaded on September 21, 2020.
[2] Attachment CCW-4DR.
[3] *The Value Line Investment Survey*, July 24, August 14, and September 11, 2020.

Arizona Public Service Company

Payout Ratios

Line	Company	Dividends Per Share		Earnings Per Share		Payout Ratio	
		2019	Projected	2019	Projected	2019	Projected
		(1)	(2)	(3)	(4)	(5)	(6)
1	ALLETE, Inc.	$2.35	$2.90	$3.33	$4.25	70.57%	68.24%
2	Ameren Corporation	$1.92	$2.45	$3.35	$4.50	57.31%	54.44%
3	American Electric Power Company, Inc.	$2.71	$3.55	$4.08	$5.50	66.42%	64.55%
4	DTE Energy Company	$3.85	$5.20	$6.31	$8.50	61.01%	61.18%
5	Duke Energy Corporation	$3.75	$4.15	$5.07	$6.00	73.96%	69.17%
6	Exelon Corporation	$1.45	$1.90	$3.01	$3.50	48.17%	54.29%
7	Evergy, Inc.	$1.93	$2.55	$2.79	$3.50	69.18%	72.86%
8	FirstEnergy Corp.	$1.53	$1.90	$1.84	$3.25	83.15%	58.46%
9	OGE Energy Corp.	$1.51	$1.95	$2.24	$2.50	67.41%	78.00%
10	Otter Tail Corporation	$1.40	$1.80	$2.17	$2.75	64.52%	65.45%
11	PNM Resources, Inc.	$1.18	$1.50	$2.28	$2.75	51.75%	54.55%
12	PPL Corporation	$1.65	$1.80	$2.37	$2.75	69.62%	65.45%
13	Southern Company	$2.46	$2.86	$3.17	$3.75	77.60%	76.27%
14	Xcel Energy Inc.	$1.62	$2.15	$2.64	$3.50	61.36%	61.43%
15	**Average**	**$2.09**	**$2.62**	**$3.19**	**$4.07**	**65.86%**	**64.59%**

Source:
The Value Line Investment Survey , July 24, August 14, and September 11, 2020.

Arizona Public Service Company

Sustainable Growth Rate

Line	Company	3 to 5 Year Projections: Dividends Per Share (1)	Earnings Per Share (2)	Book Value Per Share (3)	Book Value Growth (4)	ROE (5)	Adjustment Factor (6)	Adjusted ROE (7)	Payout Ratio (8)	Retention Rate (9)	Internal Growth Rate (10)	Sustainable Growth Rate (11)
1	ALLETE, Inc.	$2.90	$4.25	$51.75	3.69%	8.21%	1.02	8.36%	68.24%	31.76%	2.66%	2.94%
2	Ameren Corporation	$2.45	$4.50	$44.50	6.34%	10.11%	1.03	10.42%	54.44%	45.56%	4.75%	7.30%
3	American Electric Power Company, Inc.	$3.55	$5.50	$53.00	5.93%	10.38%	1.03	10.68%	64.55%	35.45%	3.79%	6.29%
4	DTE Energy Company	$5.20	$8.50	$79.25	5.47%	10.73%	1.03	11.01%	61.18%	38.82%	4.27%	5.41%
5	Duke Energy Corporation	$4.15	$6.00	$71.00	3.02%	8.45%	1.01	8.58%	69.17%	30.83%	2.64%	3.12%
6	Exelon Corporation	$1.90	$3.50	$40.25	3.98%	8.70%	1.02	8.87%	54.29%	45.71%	4.05%	4.10%
7	Evergy, Inc.	$2.55	$3.50	$42.25	2.24%	8.28%	1.01	8.38%	72.86%	27.14%	2.27%	2.29%
8	FirstEnergy Corp.	$1.90	$3.25	$20.50	9.71%	15.85%	1.05	16.59%	58.46%	41.54%	6.89%	9.05%
9	OGE Energy Corp.	$1.95	$2.50	$20.50	- 0.18%	12.20%	1.00	12.18%	78.00%	22.00%	2.68%	2.68%
10	Otter Tail Corporation	$1.80	$2.75	$23.75	4.06%	11.58%	1.02	11.81%	65.45%	34.55%	4.08%	4.97%
11	PNM Resources, Inc.	$1.50	$2.75	$29.25	6.77%	9.40%	1.03	9.71%	54.55%	45.45%	4.41%	7.24%
12	PPL Corporation	$1.80	$2.75	$21.25	4.65%	12.94%	1.02	13.24%	65.45%	34.55%	4.57%	4.77%
13	Southern Company	$2.86	$3.75	$30.50	3.16%	12.30%	1.02	12.49%	76.27%	23.73%	2.96%	3.68%
14	Xcel Energy Inc.	$2.15	$3.50	$32.25	5.02%	10.85%	1.02	11.12%	61.43%	38.57%	4.29%	5.77%
15	**Average**	**$2.62**	**$4.07**	**$40.00**	**4.93%**	**10.71%**	**1.02**	**10.96%**	**64.59%**	**35.41%**	**3.88%**	**4.97%**
16	**Median**											**4.87%**

Sources and Notes:
Cols. (1), (2) and (3): *The Value Line Investment Survey*, July 24, August 14, and September 11, 2020.
Col. (4): [Col. (3) / Page 2 Col. (2)] ^ (1/number of years projected) - 1.
Col. (5): Col. (2) / Col. (3).
Col. (6): [2 * (1 + Col. (4))] / (2 + Col. (4)).
Col. (7): Col. (6) * Col. (5).
Col. (8): Col. (1) / Col. (2).
Col. (9): 1 - Col. (8).
Col. (10): Col. (9) * Col. (7).
Col. (11): Col. (10) + Page 2 Col. (9).

Arizona Public Service Company

Sustainable Growth Rate

Line	Company	13-Week Average Stock Price[1] (1)	2019 Book Value Per Share[2] (2)	Market to Book Ratio (3)	Common Shares Outstanding (in Millions)[2] 2019 (4)	Common Shares Outstanding (in Millions)[2] 3-5 Years (5)	Growth (6)	S Factor[3] (7)	V Factor[4] (8)	S * V (9)
1	ALLETE, Inc.	$55.99	$43.17	1.30	51.70	54.25	0.97%	1.25%	22.90%	0.29%
2	Ameren Corporation	$77.48	$32.73	2.37	246.20	270.00	1.86%	4.41%	57.76%	2.55%
3	American Electric Power Company, Inc.	$82.16	$39.73	2.07	494.17	555.00	2.35%	4.86%	51.64%	2.51%
4	DTE Energy Company	$113.90	$60.73	1.88	192.21	205.00	1.30%	2.43%	46.68%	1.14%
5	Duke Energy Corporation	$82.11	$61.20	1.34	733.00	785.00	1.38%	1.85%	25.46%	0.47%
6	Exelon Corporation	$37.25	$33.12	1.12	973.00	990.00	0.35%	0.39%	11.10%	0.04%
7	Evergy, Inc.	$57.20	$37.82	1.51	226.64	227.00	0.03%	0.05%	33.88%	0.02%
8	FirstEnergy Corp.	$32.61	$12.90	2.53	540.65	580.00	1.42%	3.58%	60.44%	2.16%
9	OGE Energy Corp.	$31.60	$20.69	1.53	200.10	200.00	- 0.01%	- 0.02%	34.52%	- 0.01%
10	Otter Tail Corporation	$38.77	$19.46	1.99	40.16	42.00	0.90%	1.79%	49.81%	0.89%
11	PNM Resources, Inc.	$41.42	$21.08	1.97	79.65	92.00	2.92%	5.75%	49.11%	2.82%
12	PPL Corporation	$26.88	$16.93	1.59	767.23	780.00	0.33%	0.53%	37.02%	0.19%
13	Southern Company	$53.29	$26.11	2.04	1,053.30	1,090.00	0.69%	1.40%	51.01%	0.72%
14	Xcel Energy Inc.	$67.78	$25.24	2.69	524.54	548.00	0.88%	2.36%	62.76%	1.48%
15	**Average**	**$57.03**	**$32.21**	**1.85**	**437.33**	**458.45**	**1.18%**	**2.36%**	**42.44%**	**1.18%**

Sources and Notes:

[1] S&P Global Market Intelligence, Downloaded on September 21, 2020.

[2] *The Value Line Investment Survey*, July 24, August 14, and September 11, 2020.

[3] Expected Growth in the Number of Shares, Column (3) * Column (6).

[4] Expected Profit of Stock Investment, [1 - 1 / Column (3)].

Arizona Public Service Company

Sustainable Growth Rate

Line	Company	3 to 5 Year Projections: Dividends Per Share (1)	Earnings Per Share (2)	Book Value Per Share (3)	Book Value Growth (4)	ROE (5)	Adjustment Factor (6)	Adjusted ROE (7)	Payout Ratio (8)	Retention Rate (9)	Internal Growth Rate (10)	Sustainable Growth Rate (11)
1	ALLETE, Inc.	$2.90	$4.25	$51.75	3.69%	8.21%	1.02	8.36%	68.24%	31.76%	2.66%	2.96%
2	Ameren Corporation	$2.45	$4.50	$44.50	6.34%	10.11%	1.03	10.42%	54.44%	45.56%	4.75%	7.16%
3	American Electric Power Company, Inc.	$3.55	$5.50	$53.00	5.93%	10.38%	1.03	10.68%	64.55%	35.45%	3.79%	6.28%
4	DTE Energy Company	$5.20	$8.50	$79.25	5.47%	10.73%	1.03	11.01%	61.18%	38.82%	4.27%	5.29%
5	Duke Energy Corporation	$4.15	$6.00	$71.00	3.02%	8.45%	1.01	8.58%	69.17%	30.83%	2.64%	3.14%
6	Exelon Corporation	$1.90	$3.50	$40.25	3.98%	8.70%	1.02	8.87%	54.29%	45.71%	4.05%	4.09%
7	Evergy, Inc.	$2.55	$3.50	$42.25	2.24%	8.28%	1.01	8.38%	72.86%	27.14%	2.27%	2.29%
8	FirstEnergy Corp.	$1.90	$3.25	$20.50	9.71%	15.85%	1.05	16.59%	58.46%	41.54%	6.89%	9.52%
9	OGE Energy Corp.	$1.95	$2.50	$20.50	- 0.18%	12.20%	1.00	12.18%	78.00%	22.00%	2.68%	2.68%
10	Otter Tail Corporation	$1.80	$2.75	$23.75	4.06%	11.58%	1.02	11.81%	65.45%	34.55%	4.08%	5.06%
11	PNM Resources, Inc.	$1.50	$2.75	$29.25	6.77%	9.40%	1.03	9.71%	54.55%	45.45%	4.41%	7.13%
12	PPL Corporation	$1.80	$2.75	$21.25	4.65%	12.94%	1.02	13.24%	65.45%	34.55%	4.57%	4.76%
13	Southern Company	$2.86	$3.75	$30.50	3.16%	12.30%	1.02	12.49%	76.27%	23.73%	2.96%	3.71%
14	Xcel Energy Inc.	$2.15	$3.50	$32.25	5.02%	10.85%	1.02	11.12%	61.43%	38.57%	4.29%	5.67%
15	**Average**	**$2.62**	**$4.07**	**$40.00**	**4.93%**	**10.71%**	**1.02**	**10.96%**	**64.59%**	**35.41%**	**3.88%**	**4.98%**
16	**Median**											**4.91%**

Sources and Notes:
Cols. (1), (2) and (3): *The Value Line Investment Survey*, July 24, August 14, and September 11, 2020.
Col. (4): [Col. (3) / Page 2 Col. (2)] ^ (1/number of years projected) - 1.
Col. (5): Col. (2) / Col. (3).
Col. (6): [2 * (1 + Col. (4))] / (2 + Col. (4)).
Col. (7): Col. (6) * Col. (5).
Col. (8): Col. (1) / Col. (2).
Col. (9): 1 - Col. (8).
Col. (10): Col. (9) * Col. (7).
Col. (11): Col. (10) + Page 2 Col. (9).

Arizona Public Service Company

Sustainable Growth Rate

Line	Company	26-Week Average Stock Price[1] (1)	2019 Book Value Per Share[2] (2)	Market to Book Ratio (3)	Common Shares Outstanding (in Millions)[2] 2019 (4)	Common Shares Outstanding (in Millions)[2] 3-5 Years (5)	Growth (6)	S Factor[3] (7)	V Factor[4] (8)	S * V (9)
1	ALLETE, Inc.	$56.68	$43.17	1.31	51.70	54.25	0.97%	1.27%	23.84%	0.30%
2	Ameren Corporation	$75.10	$32.73	2.29	246.20	270.00	1.86%	4.27%	56.42%	2.41%
3	American Electric Power Company, Inc.	$81.91	$39.73	2.06	494.17	555.00	2.35%	4.84%	51.50%	2.49%
4	DTE Energy Company	$108.15	$60.73	1.78	192.21	205.00	1.30%	2.31%	43.85%	1.01%
5	Duke Energy Corporation	$83.14	$61.20	1.36	733.00	785.00	1.38%	1.87%	26.39%	0.49%
6	Exelon Corporation	$37.15	$33.12	1.12	973.00	990.00	0.35%	0.39%	10.85%	0.04%
7	Evergy, Inc.	$57.90	$37.82	1.53	226.64	227.00	0.03%	0.05%	34.68%	0.02%
8	FirstEnergy Corp.	$36.90	$12.90	2.86	540.65	580.00	1.42%	4.05%	65.04%	2.63%
9	OGE Energy Corp.	$31.22	$20.69	1.51	200.10	200.00	- 0.01%	- 0.02%	33.73%	- 0.01%
10	Otter Tail Corporation	$40.61	$19.46	2.09	40.16	42.00	0.90%	1.88%	52.08%	0.98%
11	PNM Resources, Inc.	$40.63	$21.08	1.93	79.65	92.00	2.92%	5.64%	48.12%	2.71%
12	PPL Corporation	$26.33	$16.93	1.56	767.23	780.00	0.33%	0.51%	35.70%	0.18%
13	Southern Company	$54.48	$26.11	2.09	1,053.30	1,090.00	0.69%	1.43%	52.07%	0.75%
14	Xcel Energy Inc.	$64.98	$25.24	2.57	524.54	548.00	0.88%	2.26%	61.16%	1.38%
15	**Average**	**$56.80**	**$32.21**	**1.86**	**437.33**	**458.45**	**1.18%**	**2.37%**	**42.53%**	**1.19%**

Sources and Notes:
[1] S&P Global Market Intelligence, Downloaded on September 21, 2020.
[2] *The Value Line Investment Survey*, July 24, August 14, and September 11, 2020.
[3] Expected Growth in the Number of Shares, Column (3) * Column (6).
[4] Expected Profit of Stock Investment, [1 - 1 / Column (3)].

Arizona Public Service Company

Constant Growth DCF Model
(Sustainable Growth Rate)

Line	Company	13-Week AVG Stock Price[1] (1)	Sustainable Growth[2] (2)	Annualized Dividend[3] (3)	Adjusted Yield (4)	Constant Growth DCF (5)
1	ALLETE, Inc.	$55.99	2.94%	$2.47	4.54%	7.48%
2	Ameren Corporation	$77.48	7.30%	$1.98	2.74%	10.04%
3	American Electric Power Company, Inc.	$82.16	6.29%	$2.80	3.62%	9.92%
4	DTE Energy Company	$113.90	5.41%	$4.05	3.75%	9.16%
5	Duke Energy Corporation	$82.11	3.12%	$3.86	4.85%	7.96%
6	Exelon Corporation	$37.25	4.10%	$1.53	4.28%	8.37%
7	Evergy, Inc.	$57.20	2.29%	$2.02	3.61%	5.90%
8	FirstEnergy Corp.	$32.61	9.05%	$1.56	5.22%	14.27%
9	OGE Energy Corp.	$31.60	2.68%	$1.55	5.04%	7.72%
10	Otter Tail Corporation	$38.77	4.97%	$1.48	4.01%	8.98%
11	PNM Resources, Inc.	$41.42	7.24%	$1.23	3.18%	10.42%
12	PPL Corporation	$26.88	4.77%	$1.66	6.47%	11.24%
13	Southern Company	$53.29	3.68%	$2.56	4.98%	8.66%
14	Xcel Energy Inc.	$67.78	5.77%	$1.72	2.68%	8.45%
15	**Average**	**$57.03**	**4.97%**	**$2.18**	**4.21%**	**9.18%**
16	**Median**					**8.82%**

Sources:
[1] S&P Global Market Intelligence, Downloaded on September 21, 2020.
[2] Attachment CCW-7DR, page 1.
[3] *The Value Line Investment Survey*, July 24, August 14, and September 11, 2020.

Arizona Public Service Company

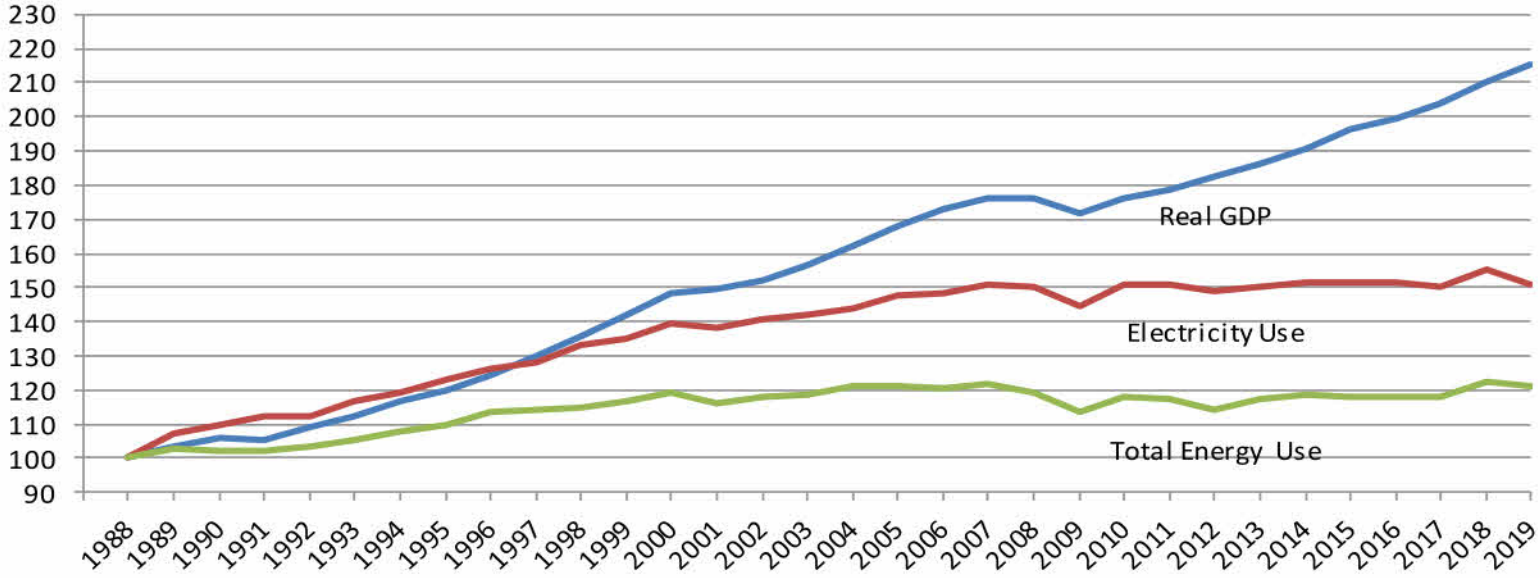
Constant Growth DCF Model
(Sustainable Growth Rate)

Line	Company	26-Week AVG Stock Price[1] (1)	Sustainable Growth[2] (2)	Annualized Dividend[3] (3)	Adjusted Yield (4)	Constant Growth DCF (5)
1	ALLETE, Inc.	$56.68	2.96%	$2.47	4.49%	7.45%
2	Ameren Corporation	$75.10	7.16%	$1.98	2.83%	9.98%
3	American Electric Power Company, Inc.	$81.91	6.28%	$2.80	3.63%	9.91%
4	DTE Energy Company	$108.15	5.29%	$4.05	3.94%	9.23%
5	Duke Energy Corporation	$83.14	3.14%	$3.86	4.79%	7.93%
6	Exelon Corporation	$37.15	4.09%	$1.53	4.29%	8.38%
7	Evergy, Inc.	$57.90	2.29%	$2.02	3.57%	5.86%
8	FirstEnergy Corp.	$36.90	9.52%	$1.56	4.63%	14.15%
9	OGE Energy Corp.	$31.22	2.68%	$1.55	5.10%	7.78%
10	Otter Tail Corporation	$40.61	5.06%	$1.48	3.83%	8.89%
11	PNM Resources, Inc.	$40.63	7.13%	$1.23	3.24%	10.37%
12	PPL Corporation	$26.33	4.76%	$1.66	6.60%	11.36%
13	Southern Company	$54.48	3.71%	$2.56	4.87%	8.58%
14	Xcel Energy Inc.	$64.98	5.67%	$1.72	2.80%	8.47%
15	**Average**	**$56.80**	**4.98%**	**$2.18**	**4.19%**	**9.17%**
16	**Median**					**8.74%**

Sources:
[1] S&P Global Market Intelligence, Downloaded on September 21, 2020.
[2] Attachment CCW-7DR, page 3.
[3] *The Value Line Investment Survey*, July 24, August 14, and September 11, 2020.

Arizona Public Service Company

Electricity Sales Are Linked to U.S. Economic Growth



Note:
1988 represents the base year. Graph depicts increases or decreases from the base year.

Sources:
U.S. Energy Information Administration
Federal Reserve Bank of St. Louis

Arizona Public Service Company

Multi-Stage Growth DCF Model

Line	Company	13-Week AVG Stock Price[1] (1)	Annualized Dividend[2] (2)	First Stage Growth[3] (3)	Second Stage Growth Year 6 (4)	Year 7 (5)	Year 8 (6)	Year 9 (7)	Year 10 (8)	Third Stage Growth[4] (9)	Multi-Stage Growth DCF (10)
1	ALLETE, Inc.	$55.99	$2.47	6.53%	6.14%	5.76%	5.38%	5.00%	4.62%	4.24%	9.53%
2	Ameren Corporation	$77.48	$1.98	6.25%	5.91%	5.58%	5.25%	4.91%	4.58%	4.24%	7.27%
3	American Electric Power Company, Inc.	$82.16	$2.80	5.77%	5.52%	5.26%	5.01%	4.75%	4.50%	4.24%	8.15%
4	DTE Energy Company	$113.90	$4.05	5.88%	5.61%	5.34%	5.06%	4.79%	4.52%	4.24%	8.35%
5	Duke Energy Corporation	$82.11	$3.86	3.94%	3.99%	4.04%	4.09%	4.14%	4.19%	4.24%	9.05%
6	Exelon Corporation	$37.25	$1.53	3.71%	3.79%	3.88%	3.97%	4.06%	4.15%	4.24%	8.38%
7	Evergy, Inc.	$57.20	$2.02	6.60%	6.21%	5.82%	5.42%	5.03%	4.64%	4.24%	8.51%
8	FirstEnergy Corp.	$32.61	$1.56	5.64%	5.41%	5.17%	4.94%	4.71%	4.48%	4.24%	9.67%
9	OGE Energy Corp.	$31.60	$1.55	3.42%	3.55%	3.69%	3.83%	3.97%	4.11%	4.24%	9.10%
10	Otter Tail Corporation	$38.77	$1.48	7.78%	7.19%	6.60%	6.01%	5.42%	4.83%	4.24%	9.19%
11	PNM Resources, Inc.	$41.42	$1.23	5.06%	4.93%	4.79%	4.65%	4.52%	4.38%	4.24%	7.50%
12	PPL Corporation	$26.88	$1.66	3.00%	3.21%	3.41%	3.62%	3.83%	4.04%	4.24%	10.22%
13	Southern Company	$53.29	$2.56	4.33%	4.31%	4.30%	4.29%	4.27%	4.26%	4.24%	9.28%
14	Xcel Energy Inc.	$67.78	$1.72	5.93%	5.65%	5.37%	5.09%	4.81%	4.52%	4.24%	7.19%
15	**Average**	**$57.03**	**$2.18**	**5.27%**	**5.10%**	**4.93%**	**4.76%**	**4.59%**	**4.42%**	**4.24%**	**8.67%**
16	**Median**										**8.78%**

Sources:
[1] S&P Global Market Intelligence, Downloaded on September 21, 2020.
[2] *The Value Line Investment Survey* , July 24, August 14, and September 11, 2020.
[3] Attachment CCW-4DR.
[4] *Blue Chip Financial Forecasts* , June 1, 2020 at 14.

Arizona Public Service Company

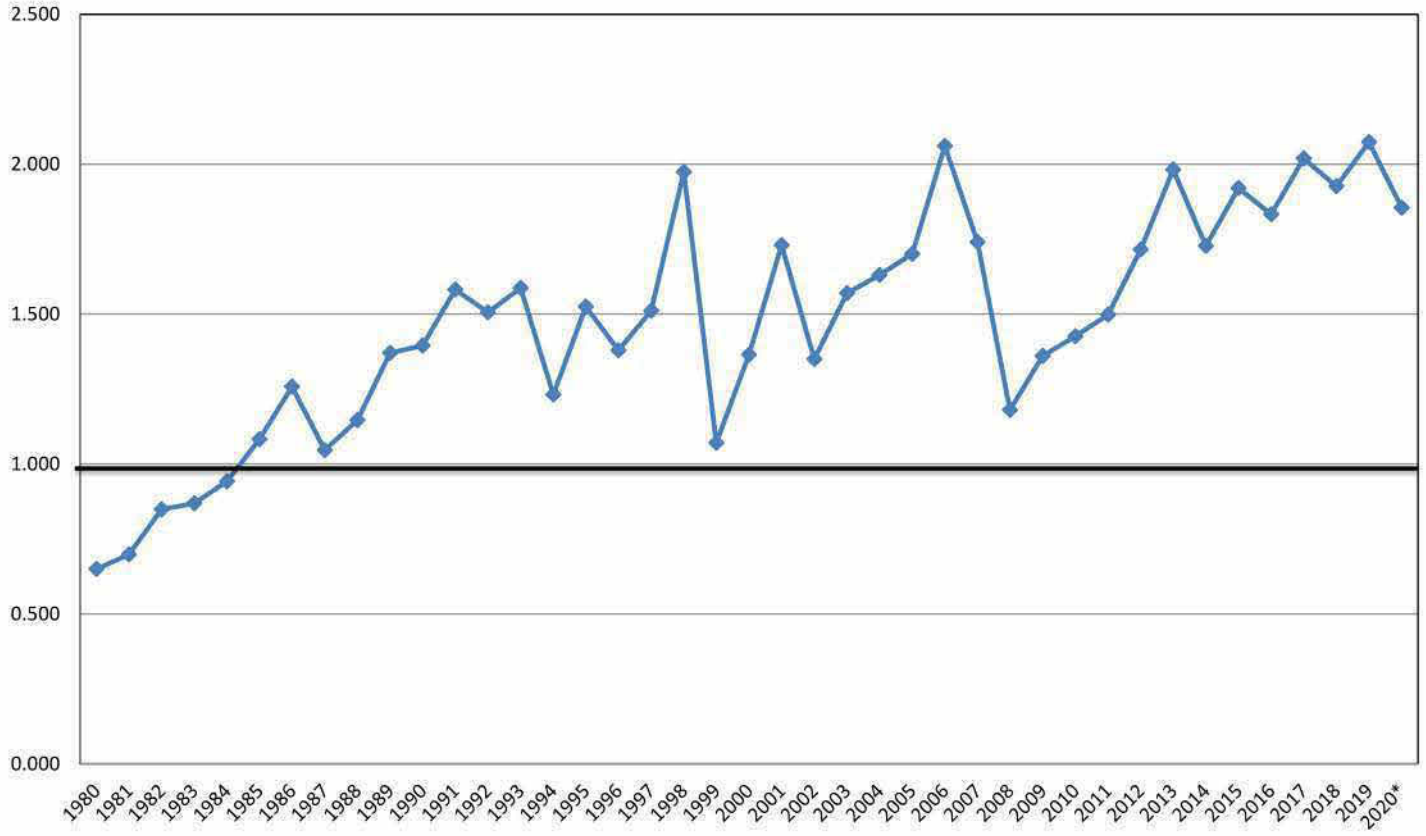
Multi-Stage Growth DCF Model

Line	Company	26-Week AVG Stock Price[1] (1)	Annualized Dividend[2] (2)	First Stage Growth[3] (3)	Second Stage Growth Year 6 (4)	Year 7 (5)	Year 8 (6)	Year 9 (7)	Year 10 (8)	Third Stage Growth[4] (9)	Multi-Stage Growth DCF (10)
1	ALLETE, Inc.	$56.68	$2.47	6.53%	6.14%	5.76%	5.38%	5.00%	4.62%	4.24%	9.46%
2	Ameren Corporation	$75.10	$1.98	6.25%	5.91%	5.58%	5.25%	4.91%	4.58%	4.24%	7.36%
3	American Electric Power Company, Inc.	$81.91	$2.80	5.77%	5.52%	5.26%	5.01%	4.75%	4.50%	4.24%	8.17%
4	DTE Energy Company	$108.15	$4.05	5.88%	5.61%	5.34%	5.06%	4.79%	4.52%	4.24%	8.57%
5	Duke Energy Corporation	$83.14	$3.86	3.94%	3.99%	4.04%	4.09%	4.14%	4.19%	4.24%	8.99%
6	Exelon Corporation	$37.15	$1.53	3.71%	3.79%	3.88%	3.97%	4.06%	4.15%	4.24%	8.39%
7	Evergy, Inc.	$57.90	$2.02	6.60%	6.21%	5.82%	5.42%	5.03%	4.64%	4.24%	8.46%
8	FirstEnergy Corp.	$36.90	$1.56	5.64%	5.41%	5.17%	4.94%	4.71%	4.48%	4.24%	9.05%
9	OGE Energy Corp.	$31.22	$1.55	3.42%	3.55%	3.69%	3.83%	3.97%	4.11%	4.24%	9.16%
10	Otter Tail Corporation	$40.61	$1.48	7.78%	7.19%	6.60%	6.01%	5.42%	4.83%	4.24%	8.97%
11	PNM Resources, Inc.	$40.63	$1.23	5.06%	4.93%	4.79%	4.65%	4.52%	4.38%	4.24%	7.56%
12	PPL Corporation	$26.33	$1.66	3.00%	3.21%	3.41%	3.62%	3.83%	4.04%	4.24%	10.34%
13	Southern Company	$54.48	$2.56	4.33%	4.31%	4.30%	4.29%	4.27%	4.26%	4.24%	9.17%
14	Xcel Energy Inc.	$64.98	$1.72	5.93%	5.65%	5.37%	5.09%	4.81%	4.52%	4.24%	7.31%
15	**Average**	**$56.80**	**$2.18**	**5.27%**	**5.10%**	**4.93%**	**4.76%**	**4.59%**	**4.42%**	**4.24%**	**8.64%**
16	**Median**										**8.77%**

Sources:
[1] S&P Global Market Intelligence, Downloaded on September 21, 2020.
[2] *The Value Line Investment Survey* , July 24, August 14, and September 11, 2020.
[3] Attachment CCW-4DR.
[4] *Blue Chip Financial Forecasts* , June 1, 2020 at 14.

Arizona Public Service Company

Common Stock Market/Book Ratio



Source:
1980 - 2000: Mergent Public Utility Manual.
2001 - 2015: AUS Utility Reports, multiple dates.
2016 - 2019: Value Line Investment Survey, multiple dates.
* Value Line Investment Survey Reports, July 24, August 14, August 28, and September 11, 2020.

Arizona Public Service Company

Equity Risk Premium - Treasury Bond

Line	Year	Authorized Electric Returns[1] (1)	30 yr. Treasury Bond Yield[2] (2)	Indicated Risk Premium (3)	Rolling 5 - Year Average (4)	Rolling 10 - Year Average (5)
1	1986	13.93%	7.80%	6.13%		
2	1987	12.99%	8.58%	4.41%		
3	1988	12.79%	8.96%	3.83%		
4	1989	12.97%	8.45%	4.52%		
5	1990	12.70%	8.61%	4.09%	4.60%	
6	1991	12.55%	8.14%	4.41%	4.25%	
7	1992	12.09%	7.67%	4.42%	4.26%	
8	1993	11.41%	6.60%	4.81%	4.45%	
9	1994	11.34%	7.37%	3.97%	4.34%	
10	1995	11.55%	6.88%	4.67%	4.46%	4.53%
11	1996	11.39%	6.70%	4.69%	4.51%	4.38%
12	1997	11.40%	6.61%	4.79%	4.59%	4.42%
13	1998	11.66%	5.58%	6.08%	4.84%	4.65%
14	1999	10.77%	5.87%	4.90%	5.03%	4.68%
15	2000	11.43%	5.94%	5.49%	5.19%	4.82%
16	2001	11.09%	5.49%	5.60%	5.37%	4.94%
17	2002	11.16%	5.43%	5.73%	5.56%	5.07%
18	2003	10.97%	4.96%	6.01%	5.55%	5.19%
19	2004	10.75%	5.05%	5.70%	5.71%	5.37%
20	2005	10.54%	4.65%	5.89%	5.79%	5.49%
21	2006	10.34%	4.90%	5.44%	5.76%	5.56%
22	2007	10.31%	4.83%	5.48%	5.71%	5.63%
23	2008	10.37%	4.28%	6.09%	5.72%	5.63%
24	2009	10.52%	4.07%	6.45%	5.87%	5.79%
25	2010	10.29%	4.25%	6.04%	5.90%	5.84%
26	2011	10.19%	3.91%	6.28%	6.07%	5.91%
27	2012	10.01%	2.92%	7.09%	6.39%	6.05%
28	2013	9.81%	3.45%	6.36%	6.44%	6.08%
29	2014	9.75%	3.34%	6.41%	6.44%	6.15%
30	2015	9.60%	2.84%	6.76%	6.58%	6.24%
31	2016	9.60%	2.60%	7.00%	6.72%	6.40%
32	2017	9.68%	2.90%	6.79%	6.66%	6.53%
33	2018	9.55%	3.11%	6.44%	6.68%	6.56%
34	2019	9.64%	2.58%	7.06%	6.81%	6.62%
35	2020 [3]	9.47%	1.63%	7.84%	7.02%	6.80%
36	**Average**	**10.99%**	**5.34%**	**5.65%**	**5.59%**	**5.59%**
37	**Minimum**				**4.25%**	**4.38%**
38	**Maximum**				**7.02%**	**6.80%**

Sources:

[1] *Regulatory Research Associates, Inc*., Regulatory Focus, Major Rate Case Decisions, Jan. 1997 p. 5, and Jan. 2011 p. 3. *S&P Global Market Intelligence*, RRA Regulatory Focus, Major Rate Case Decisions, January - June 2020, July 22, 2020, p. 1.
2006 - 2019 Authorized Returns exclude limited issue rider cases.

[2] St. Louis Federal Reserve: Economic Research, http://research.stlouisfed.org/.
The yields from 2002 to 2005 represent the 20-Year Treasury yields obtained from the Federal Reserve Bank.

[3] Data represents January - June, 2020.

Arizona Public Service Company

Equity Risk Premium - Utility Bond

Line	Year	Authorized Electric Returns[1] (1)	Average "A" Rated Utility Bond Yield[2] (2)	Indicated Risk Premium (3)	Rolling 5 - Year Average (4)	Rolling 10 - Year Average (5)
1	1986	13.93%	9.58%	4.35%		
2	1987	12.99%	10.10%	2.89%		
3	1988	12.79%	10.49%	2.30%		
4	1989	12.97%	9.77%	3.20%		
5	1990	12.70%	9.86%	2.84%	3.12%	
6	1991	12.55%	9.36%	3.19%	2.88%	
7	1992	12.09%	8.69%	3.40%	2.99%	
8	1993	11.41%	7.59%	3.82%	3.29%	
9	1994	11.34%	8.31%	3.03%	3.26%	
10	1995	11.55%	7.89%	3.66%	3.42%	3.27%
11	1996	11.39%	7.75%	3.64%	3.51%	3.20%
12	1997	11.40%	7.60%	3.80%	3.59%	3.29%
13	1998	11.66%	7.04%	4.62%	3.75%	3.52%
14	1999	10.77%	7.62%	3.15%	3.77%	3.52%
15	2000	11.43%	8.24%	3.19%	3.68%	3.55%
16	2001	11.09%	7.76%	3.33%	3.62%	3.56%
17	2002	11.16%	7.37%	3.79%	3.61%	3.60%
18	2003	10.97%	6.58%	4.39%	3.57%	3.66%
19	2004	10.75%	6.16%	4.59%	3.86%	3.82%
20	2005	10.54%	5.65%	4.89%	4.20%	3.94%
21	2006	10.34%	6.07%	4.27%	4.39%	4.00%
22	2007	10.31%	6.07%	4.24%	4.48%	4.04%
23	2008	10.37%	6.53%	3.84%	4.37%	3.97%
24	2009	10.52%	6.04%	4.48%	4.34%	4.10%
25	2010	10.29%	5.47%	4.82%	4.33%	4.26%
26	2011	10.19%	5.04%	5.15%	4.51%	4.45%
27	2012	10.01%	4.13%	5.88%	4.83%	4.66%
28	2013	9.81%	4.48%	5.33%	5.13%	4.75%
29	2014	9.75%	4.28%	5.47%	5.33%	4.84%
30	2015	9.60%	4.12%	5.48%	5.46%	4.90%
31	2016	9.60%	3.93%	5.67%	5.57%	5.04%
32	2017	9.68%	4.00%	5.68%	5.53%	5.18%
33	2018	9.55%	4.25%	5.30%	5.52%	5.33%
34	2019	9.64%	3.77%	5.87%	5.60%	5.47%
35	2020 [3]	9.47%	3.29%	6.18%	5.74%	5.60%
36	**Average**	**10.99%**	**6.71%**	**4.28%**	**4.23%**	**4.21%**
37	**Minimum**				**2.88%**	**3.20%**
38	**Maximum**				**5.74%**	**5.60%**

Sources:

[1] *Regulatory Research Associates, Inc*., Regulatory Focus, Major Rate Case Decisions, Jan. 1997 p. 5, and Jan. 2011 p. 3.
S&P Global Market Intelligence, RRA Regulatory Focus, Major Rate Case Decisions, January - June 2020, July 22, 2020, p. 1.
2006 - 2019 Authorized Returns exclude limited issue rider cases.

[2] St. Louis Federal Reserve: Economic Research, http://research.stlouisfed.org/.
The yields from 2002 to 2005 represent the 20-Year Treasury yields obtained from the Federal Reserve Bank.

[3] Data represents January - June, 2020.

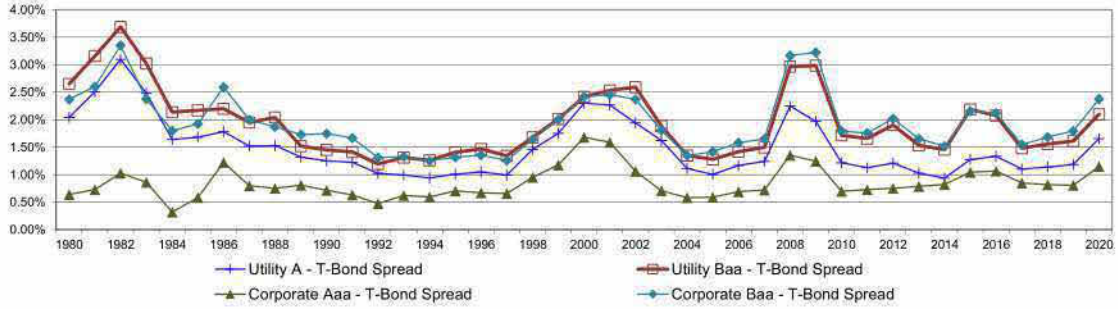
Arizona Public Service Company

Bond Yield Spreads

Line	Year	T-Bond Yield[1] (1)	Public Utility Bond A[2] (2)	Public Utility Bond Baa[2] (3)	Public Utility Bond A-T-Bond Spread (4)	Public Utility Bond Baa-T-Bond Spread (5)	Corporate Bond Aaa[3] (6)	Corporate Bond Baa[3] (7)	Corporate Bond Aaa-T-Bond Spread (8)	Corporate Bond Baa-T-Bond Spread (9)	Utility to Corporate Baa Spread (10)	Utility to Corporate A-Aaa Spread (11)
1	1980	11.30%	13.34%	13.95%	2.04%	2.65%	11.94%	13.67%	0.64%	2.37%	0.28%	1.40%
2	1981	13.44%	15.95%	16.60%	2.51%	3.16%	14.17%	16.04%	0.73%	2.60%	0.56%	1.78%
3	1982	12.76%	15.86%	16.45%	3.10%	3.69%	13.79%	16.11%	1.03%	3.35%	0.34%	2.07%
4	1983	11.18%	13.66%	14.20%	2.48%	3.02%	12.04%	13.55%	0.86%	2.38%	0.65%	1.62%
5	1984	12.39%	14.03%	14.53%	1.64%	2.14%	12.71%	14.19%	0.32%	1.80%	0.34%	1.32%
6	1985	10.79%	12.47%	12.96%	1.68%	2.17%	11.37%	12.72%	0.58%	1.93%	0.24%	1.10%
7	1986	7.80%	9.58%	10.00%	1.78%	2.20%	9.02%	10.39%	1.22%	2.59%	-0.39%	0.56%
8	1987	8.58%	10.10%	10.53%	1.52%	1.95%	9.38%	10.58%	0.80%	2.00%	-0.05%	0.72%
9	1988	8.96%	10.49%	11.00%	1.53%	2.04%	9.71%	10.83%	0.75%	1.87%	0.17%	0.78%
10	1989	8.45%	9.77%	9.97%	1.32%	1.52%	9.26%	10.18%	0.81%	1.73%	-0.21%	0.51%
11	1990	8.61%	9.86%	10.06%	1.25%	1.45%	9.32%	10.36%	0.71%	1.75%	-0.30%	0.54%
12	1991	8.14%	9.36%	9.55%	1.22%	1.41%	8.77%	9.80%	0.63%	1.67%	-0.25%	0.59%
13	1992	7.67%	8.69%	8.86%	1.02%	1.19%	8.14%	8.98%	0.47%	1.31%	-0.12%	0.55%
14	1993	6.60%	7.59%	7.91%	0.99%	1.31%	7.22%	7.93%	0.62%	1.33%	-0.02%	0.37%
15	1994	7.37%	8.31%	8.63%	0.94%	1.26%	7.96%	8.62%	0.59%	1.25%	0.01%	0.35%
16	1995	6.88%	7.89%	8.29%	1.01%	1.41%	7.59%	8.20%	0.71%	1.32%	0.09%	0.30%
17	1996	6.70%	7.75%	8.17%	1.05%	1.47%	7.37%	8.05%	0.67%	1.35%	0.12%	0.38%
18	1997	6.61%	7.60%	7.95%	0.99%	1.34%	7.26%	7.86%	0.66%	1.26%	0.09%	0.34%
19	1998	5.58%	7.04%	7.26%	1.46%	1.68%	6.53%	7.22%	0.95%	1.64%	0.04%	0.51%
20	1999	5.87%	7.62%	7.88%	1.75%	2.01%	7.04%	7.87%	1.18%	2.01%	0.01%	0.58%
21	2000	5.94%	8.24%	8.36%	2.30%	2.42%	7.62%	8.36%	1.68%	2.42%	-0.01%	0.62%
22	2001	5.49%	7.76%	8.03%	2.27%	2.54%	7.08%	7.95%	1.59%	2.45%	0.08%	0.68%
23	2002	5.43%	7.37%	8.02%	1.94%	2.59%	6.49%	7.80%	1.06%	2.37%	0.22%	0.88%
24	2003	4.96%	6.58%	6.84%	1.62%	1.89%	5.67%	6.77%	0.71%	1.81%	0.08%	0.91%
25	2004	5.05%	6.16%	6.40%	1.11%	1.35%	5.63%	6.39%	0.58%	1.35%	0.00%	0.53%
26	2005	4.65%	5.65%	5.93%	1.00%	1.28%	5.24%	6.06%	0.59%	1.42%	-0.14%	0.41%
27	2006	4.90%	6.07%	6.32%	1.17%	1.42%	5.59%	6.48%	0.69%	1.58%	-0.16%	0.48%
28	2007	4.83%	6.07%	6.33%	1.24%	1.50%	5.56%	6.48%	0.72%	1.65%	-0.15%	0.52%
29	2008	4.28%	6.53%	7.25%	2.25%	2.97%	5.63%	7.45%	1.35%	3.17%	-0.20%	0.90%
30	2009	4.07%	6.04%	7.06%	1.97%	2.99%	5.31%	7.30%	1.24%	3.23%	-0.24%	0.73%
31	2010	4.25%	5.47%	5.96%	1.22%	1.71%	4.95%	6.04%	0.70%	1.79%	-0.08%	0.52%
32	2011	3.91%	5.04%	5.57%	1.13%	1.66%	4.64%	5.67%	0.73%	1.76%	-0.10%	0.40%
33	2012	2.92%	4.13%	4.83%	1.21%	1.90%	3.67%	4.94%	0.75%	2.02%	-0.11%	0.46%
34	2013	3.45%	4.48%	4.98%	1.03%	1.53%	4.24%	5.10%	0.79%	1.65%	-0.12%	0.24%
35	2014	3.34%	4.28%	4.80%	0.94%	1.46%	4.16%	4.86%	0.82%	1.52%	-0.06%	0.12%
36	2015	2.84%	4.12%	5.03%	1.27%	2.19%	3.89%	5.00%	1.05%	2.16%	0.03%	0.23%
37	2016	2.60%	3.93%	4.67%	1.33%	2.08%	3.66%	4.71%	1.07%	2.12%	-0.04%	0.27%
38	2017	2.90%	4.00%	4.38%	1.10%	1.48%	3.74%	4.44%	0.85%	1.55%	-0.06%	0.26%
39	2018	3.11%	4.25%	4.67%	1.14%	1.56%	3.93%	4.80%	0.82%	1.69%	-0.13%	0.32%
40	2019	2.58%	3.77%	4.19%	1.18%	1.61%	3.39%	4.38%	0.81%	1.79%	-0.18%	0.38%
41	2020[4]	1.63%	3.29%	3.73%	1.66%	2.10%	2.78%	4.01%	1.15%	2.38%	-0.27%	0.51%
42	**Average**	**6.31%**	**7.81%**	**8.25%**	**1.50%**	**1.93%**	**7.16%**	**8.25%**	**0.85%**	**1.94%**	**0.00%**	**0.65%**

Yield Spreads

Treasury Vs. Corporate & Treasury Vs. Utility



Sources:

[1] St. Louis Federal Reserve: Economic Research, http://research.stlouisfed.org/.

[2] The utility yields for the period 1980-2000 were obtained from Mergent Public Utility Manual, Mergent Weekly News Reports, 2003.
The utility yields for the period 2001-2009 were obtained from the Mergent Bond Record.
The utility yields for the period 2010-2019 were obtained from http://credittrends.moodys.com/.

[3] The corporate yields for the period 1980-2009 were obtained from the St. Louis Federal Reserve: Economic Research, http://research.stlouisfed.org/.
The corporate yields from 2010-2019 were obtained from http://credittrends.moodys.com/.

[4] Data represents January - June, 2020.

Arizona Public Service Company

Treasury and Utility Bond Yields

Line	Date	Treasury Bond Yield[1] (1)	"A" Rated Utility Bond Yield[2] (2)	"Baa" Rated Utility Bond Yield[2] (3)
1	09/18/20	1.45%	2.86%	3.18%
2	09/11/20	1.42%	2.83%	3.16%
3	09/04/20	1.46%	2.87%	3.19%
4	08/28/20	1.52%	2.92%	3.24%
5	08/21/20	1.35%	2.74%	3.06%
6	08/14/20	1.45%	2.79%	3.11%
7	08/07/20	1.23%	2.59%	2.93%
8	07/31/20	1.20%	2.56%	2.93%
9	07/24/20	1.23%	2.59%	2.97%
10	07/17/20	1.33%	2.73%	3.07%
11	07/10/20	1.33%	2.80%	3.15%
12	07/02/20	1.43%	2.99%	3.36%
13	06/26/20	1.37%	2.95%	3.35%
14	**Average**	**1.37%**	**2.79%**	**3.13%**
15	**Spread To Treasury**		**1.42%**	**1.76%**

Sources:

[1] St. Louis Federal Reserve: Economic Research, http://research.stlouisfed.org.

[2] http://credittrends.moodys.com/.

Arizona Public Service Company

Treasury and Utility Bond Yields

Line	Date	Treasury Bond Yield[1] (1)	"A" Rated Utility Bond Yield[2] (2)	"Baa" Rated Utility Bond Yield[2] (3)
1	09/18/20	1.45%	2.86%	3.18%
2	09/11/20	1.42%	2.83%	3.16%
3	09/04/20	1.46%	2.87%	3.19%
4	08/28/20	1.52%	2.92%	3.24%
5	08/21/20	1.35%	2.74%	3.06%
6	08/14/20	1.45%	2.79%	3.11%
7	08/07/20	1.23%	2.59%	2.93%
8	07/31/20	1.20%	2.56%	2.93%
9	07/24/20	1.23%	2.59%	2.97%
10	07/17/20	1.33%	2.73%	3.07%
11	07/10/20	1.33%	2.80%	3.15%
12	07/02/20	1.43%	2.99%	3.36%
13	06/26/20	1.37%	2.95%	3.35%
14	06/19/20	1.47%	3.00%	3.40%
15	06/12/20	1.45%	3.05%	3.41%
16	06/05/20	1.68%	3.23%	3.59%
17	05/29/20	1.41%	3.11%	3.47%
18	05/22/20	1.37%	3.14%	3.61%
19	05/15/20	1.32%	3.17%	3.70%
20	05/08/20	1.39%	3.13%	3.68%
21	05/01/20	1.27%	2.95%	3.50%
22	04/24/20	1.17%	2.93%	3.49%
23	04/17/20	1.27%	3.02%	3.60%
24	04/09/20	1.35%	3.47%	4.08%
25	04/03/20	1.24%	3.55%	4.26%
26	03/27/20	1.29%	3.94%	4.45%
27	**Average**	**1.36%**	**3.00%**	**3.42%**
28	**Spread To Treasury**		**1.64%**	**2.06%**

Sources:

[1] St. Louis Federal Reserve: Economic Research, http://research.stlouisfed.org.

[2] http://credittrends.moodys.com/.

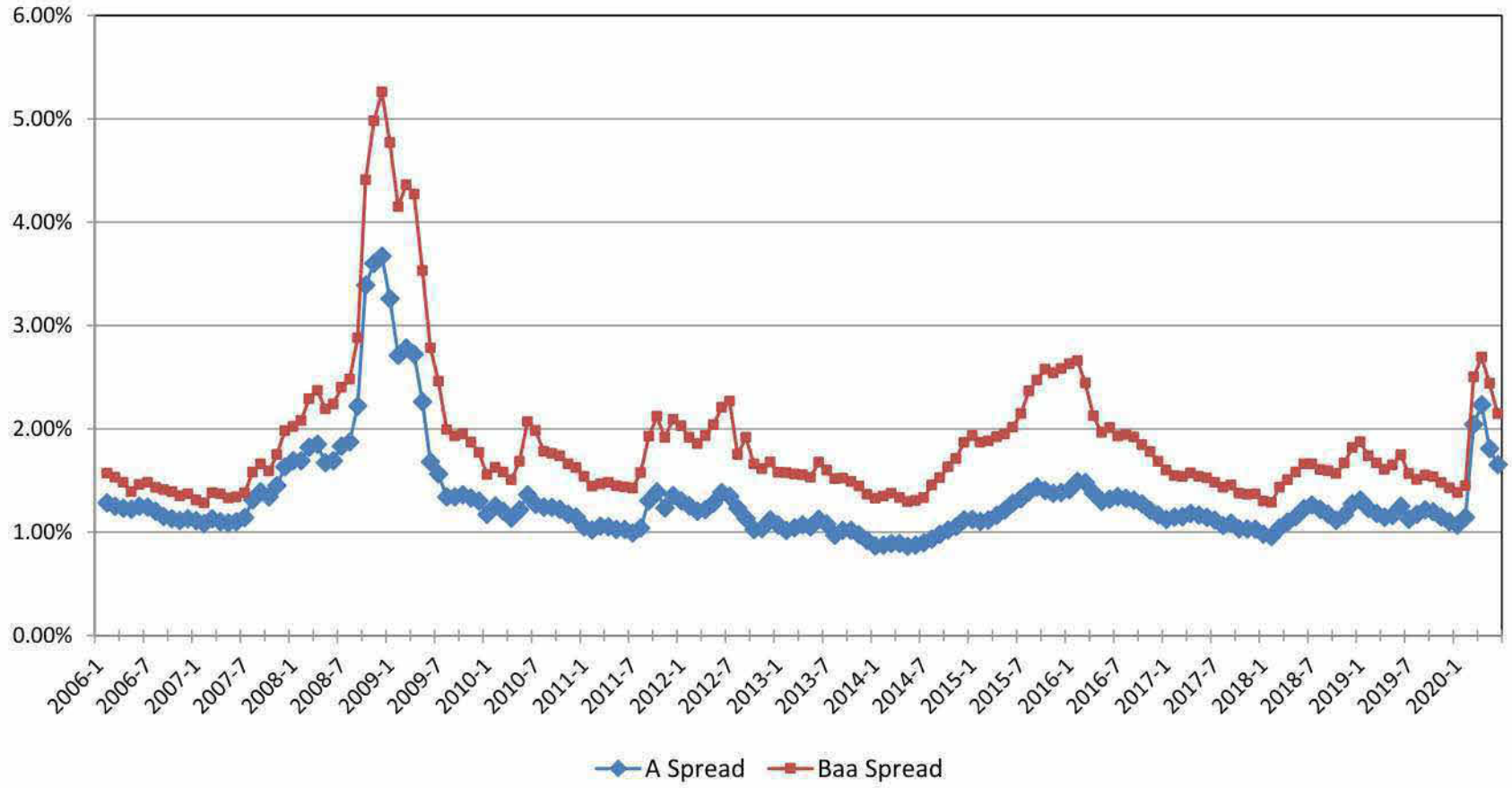
Arizona Public Service Company

Trends in Bond Yields

Sources:
Mergent Bond Record.
www.moodys.com, Bond Yields and Key Indicators.
St. Louis Federal Reserve: Economic Research, http://research.stlouisfed.org/

Arizona Public Service Company

Yield Spread Between Utility Bonds and 30-Year Treasury Bonds



Sources:
Mergent Bond Record.
www.moodys.com, Bond Yields and Key Indicators.
St. Louis Federal Reserve: Economic Research, http://research.stlouisfed.org/

Arizona Public Service Company

Beta

Line	Company	Value Line Beta[1]	S&P Global Market Intelligence Beta[2]
1	ALLETE, Inc.	0.85	0.67
2	Ameren Corporation	0.80	0.61
3	American Electric Power Company, Inc.	0.75	0.62
4	DTE Energy Company	0.90	0.67
5	Duke Energy Corporation	0.85	0.61
6	Exelon Corporation	0.95	0.68
7	Evergy, Inc.	1.00	0.62
8	FirstEnergy Corp.	0.85	0.65
9	OGE Energy Corp.	1.05	0.74
10	Otter Tail Corporation	0.85	0.71
11	PNM Resources, Inc.	0.90	0.85
12	PPL Corporation	1.10	0.87
13	Southern Company	0.90	0.70
14	Xcel Energy Inc.	0.75	0.68
15	**Average**	**0.89**	**0.69**
16	**Median**	**0.88**	**0.68**
17	**Historical Beta[3]**	**0.72**	

Source:
[1] *The Value Line Investment Survey*,
July 24, August 14, and September 11, 2020.
[2] S&P Global Market Intelligence, data through September 18, 2020.
[3] Attachment CCW-16DR, page 2.

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Historical Betas
(Electric Utilities)

Line	Company	Average	2Q20	1Q20	4Q19	3Q19	2Q19	1Q19	4Q18	3Q18	2Q18	1Q18	4Q17	3Q17	2Q17	1Q17	4Q16	3Q16	2Q16	1Q16	4Q15	3Q15	2Q15	1Q15	4Q14	3Q14
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
1	ALLETE, Inc.	0.75	0.85	0.60	0.65	0.65	0.65	0.65	0.65	0.70	0.75	0.75	0.80	0.75	0.80	0.80	0.75	0.75	0.75	0.80	0.80	0.80	0.80	0.80	0.80	0.80
2	Ameren Corporation	0.67	0.80	0.50	0.55	0.55	0.60	0.60	0.55	0.60	0.65	0.65	0.70	0.65	0.65	0.70	0.65	0.70	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
3	American Electric Power Company, Inc.	0.64	0.75	0.50	0.55	0.55	0.55	0.55	0.55	0.60	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
4	DTE Energy Company	0.66	0.90	0.50	0.55	0.55	0.55	0.55	0.55	0.60	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.70	0.70	0.75	0.75	0.75	0.75	0.75	0.75	0.75
5	Duke Energy Corporation	0.58	0.85	0.45	0.50	0.50	0.50	0.50	0.55	0.55	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.65	0.50	0.60	0.60	0.60	0.60	0.60
6	Exelon Corporation	0.69	0.90	0.65	0.70	0.70	0.70	0.70	0.65	0.65	0.70	0.70	0.70	0.70	0.65	0.70	0.65	0.70	0.65	0.70	0.70	0.65	0.70	0.70	0.70	0.70
7	Evergy, Inc.	1.05	1.05	NMF	NMF	NMF	NMF	NMF	NMF	NMF	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8	FirstEnergy Corp.	0.67	0.85	0.60	0.65	0.60	0.65	0.65	0.60	0.60	0.65	0.70	0.70	0.65	0.65	0.65	0.65	0.65	0.70	0.65	0.70	0.65	0.70	0.70	0.70	0.70
9	OGE Energy Corp.	0.90	1.05	0.70	0.75	0.80	0.80	0.85	0.85	0.90	0.95	0.95	0.95	0.95	0.95	0.95	0.90	0.90	0.95	0.95	0.95	0.90	0.90	0.90	0.90	0.85
10	Otter Tail Corporation	0.83	0.85	0.70	0.70	0.65	0.70	0.70	0.75	0.80	0.85	0.85	0.90	0.90	0.90	0.85	0.85	0.85	0.80	0.85	0.85	0.85	0.90	0.90	0.90	0.95
11	PNM Resources, Inc.	0.73	0.50	0.60	0.60	0.60	0.65	0.65	0.60	0.75	0.70	0.75	0.75	0.75	0.70	0.75	0.75	0.80	0.80	0.80	0.85	0.85	0.85	0.85	0.85	0.85
12	PPL Corporation	0.70	1.05	0.65	0.70	0.65	0.70	0.70	0.70	0.70	0.75	0.75	0.75	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.65	0.65	0.65	0.60	0.65
13	Southern Company	0.56	0.90	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.55	0.65	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.60	0.60	0.55	0.60	0.55	0.55	0.60
14	Xcel Energy Inc.	0.59	0.45	0.50	0.50	0.50	0.50	0.50	0.55	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.70	0.65
15	**Average**	0.72	0.84	0.57	0.61	0.60	0.62	0.62	0.62	0.66	0.70	0.71	0.72	0.70	0.70	0.70	0.69	0.71	0.72	0.73	0.73	0.72	0.73	0.73	0.73	0.73

Source: Value Line Software Analyzer

Arizona Public Service Company

CAPM Return

Line	Description	Risk Premium[2] Derived MRP (1)	FERC 2-Step DCF[3] Derived MRP (2)	DCF[3] Derived MRP (3)
	Current Value Line Beta			
1	Risk-Free Rate[1]	1.80%	1.80%	1.80%
2	Market Risk Premium	9.40%	10.10%	11.60%
3	Beta[4]	0.89	0.89	0.89
4	**CAPM**	**10.19%**	**10.82%**	**12.16%**
	Historical Value Line Beta			
5	Risk-Free Rate[1]	1.80%	1.80%	1.80%
6	Market Risk Premium	9.40%	10.10%	11.60%
7	Historical Beta[4]	0.72	0.72	0.72
8	**CAPM**	**8.53%**	**9.03%**	**10.11%**
	Current S&P Global Market Intelligence Beta			
9	Risk-Free Rate[1]	1.80%	1.80%	1.80%
10	Market Risk Premium	9.40%	10.10%	11.60%
11	Historical Beta[4]	0.69	0.69	0.69
12	**CAPM**	**8.31%**	**8.79%**	**9.83%**

Sources:

[1] *Blue Chip Financial Forecasts*, September 1, 2020, at 2.

[2] *Duff & Phelps, 2020 SBBI Yearbook* at 6-18.

[3] *State Street Global Advisors, downloaded 9/21/2020.*

[4] Attachment CCW-16DR, page 1.

Arizona Public Service Company

Development of the Market Risk Premium

Line	Description	MRP
Risk Premium Based Method:		
1	Lg. Co. Stock Real Market Return	9.00% [1]
2	Projected Consumer Price Index	2.00% [2]
3	Expected Market Return	11.18%
4	Risk-Free Rate	1.80% [2]
5	Market Risk Premium	**9.40%**
FERC 2-Step DCF Based Method:		
6	Short-Term S&P 500 Growth	11.51% [3]
7	Long-Term GDP Growth	4.24% [4]
8	Blended Growth Rate	10.06% [5]
9	Index Dividend Yield	1.68% [3]
10	Adjusted Yield	1.85%
11	Expected Market Return	11.91%
12	Risk-Free Rate	1.80% [2]
13	Market Risk Premium	**10.10%**
DCF Based Method:		
14	S&P 500 Growth	11.51% [3]
15	Index Dividend Yield	1.68% [3]
16	Adjusted Yield	1.87%
17	Expected Market Return	13.38%
18	Risk-Free Rate	1.80% [2]
19	Market Risk Premium	**11.60%**

Sources & Note:

[1] Duff & Phelps 2020 SBBI Yearbook at 6-18.

[2] *Blue Chip Financial Forecasts*, June 1, 2020.

[3] State Street Global Advisors, SPDR S&P 500 ETF, downloaded 9/21/2020.

[4] *Blue Chip Financial Forecasts*, June 1, 2020 at 14.

[5] (80%*11.51%) + (20%*4.24%) = 10.06%.

Arizona Public Service Company

Standard & Poor's Credit Metrics

Line	Description	Retail Cost of Service Amount (1)	S&P Benchmark (Medial Volatility) Intermediate (2)	Significant (3)	Aggressive (4)	Reference (5)
1	Rate Base ($ 000)	$ 8,872,984				Schedule A-2.
2	Weighted Common Return	5.08%				Attach. CCW-1DR, Line 2, Col.4.
3	Pre-Tax Rate of Return	8.61%				Attach. CCW-1DR, Line 3. Col.5.
4	Income to Common	$ 450,748				Line 1 x Line 2.
5	Fair Value Increment	$ 30,719				Workpaper 2.1, Line 9.
6	EBIT	$ 794,710				Line 1 x Line 3 + Line 5.
7	Depreciation & Amortization	$ 647,485				Schedule C-1.
8	Imputed Amortization	$ 23,892				S&P Capital IQ, dowloaded June 17, 2020.
9	Capitalized Interest	$ (23,293)				Response to FEA 1.12, Schedule E-2.
10	Deferred Income Taxes & ITC	$ 33,882				Schedule E-3.
11	Funds from Operations (FFO)	$ 1,163,433				Sum of Lines 4 & 5 and Lines 7 through 10.
12	Imputed Interest Expense	$ 3,827				S&P Capital IQ, dowloaded June 17, 2020.
13	EBITDA	$ 1,469,915				Sum of Lines 6 through 8 and Line 12.
14	Adjusted Debt	$ 4,282,325				Page 3, Lines 4, Col. 1 x RB Allocator.
15	Total Adjusted Debt Ratio	48.5%				Page 3, Sum Lines 5, Col 2.
16	Debt to EBITDA	2.9x	2.5x - 3.5x	3.5x - 4.5x	4.5x - 5.5x	Line 14 / Line 13.
17	FFO to Total Debt	27%	23% - 35%	13% - 23%	9% - 13%	Line 11 / Line 14.
18	Indicative Credit Rating		**A**	**A-**	**BBB**	S&P Methodology, November 19, 2013.

Source:
Standard & Poor's: "Criteria: Corporate Methodology," November 19, 2013.

Note:
Based on the May 2020 S&P report, APS has an "Excellent" business profile and a "Significant" financial profile, and falls under the 'Medial Volatility' matrix.

S&P Business/Financial Risk Profile Matrix			
Business Risk Profile	**Financial Risk Profile**		
	3 (intermediate)	4 (significant)	5 (aggressive)
1 (excellent)	a+/a	a-	bbb
2 (strong)	a-/bbb+	bbb	bb+
3 (satisfactory)	bbb/bbb-	bbb-/bb+	bb

Arizona Public Service Company

Standard & Poor's Credit Metrics
(Off-Balance Sheet Debt)

Line	Description		Amount (1)	Weight (2)
1	Long -Term Debt	$	4,726,125	42.702%
2	Short-Term Debt*	$	350,000	3.162%
3	OBS Debt*	$	290,597	2.626%
4	**Total Debt**	**$**	**5,366,722**	**48.490%**
5	Common Equity	$	5,700,968	51.510%
6	**Total**	$	11,067,690	**100.000%**

Sources:
Page 2.
*S&P Capital IQ, dowloaded June 17, 2020.

Arizona Public Service Company

S&P Adjusted Debt Ratio

Operating Subsidiaries of Value Line Electric, Gas and Water Utilities
(Industry Medians)

		% Distribution of 9 Year Average		
Rating	**Median**	**<50**	**50 to 55**	**>55**
AA-	45.49%	100%	0%	0%
A+	56.11%	33%	0%	67%
A	49.50%	53%	33%	13%
A-	52.44%	30%	50%	20%
BBB+	49.98%	53%	26%	21%
BBB	55.98%	7%	27%	67%
BBB-	53.14%	0%	100%	0%

Source:
S&P Capital IQ, downloaded December 27, 2019.

Arizona Public Service Company

Revised Bulkley 30-DAY CONSTANT GROWTH DCF

Company	Annualized Dividend (1)	Stock Price (2)	Dividend Yield (3)	Expected Dividend Yield (4)	Value Line Earnings Growth (5)	Yahoo! Finance Earnings Growth (6)	Zacks Earnings Growth (7)	Average Growth Rate (8)	All Proxy Group Low ROE (9)	All Proxy Group Mean ROE (10)	All Proxy Group High ROE (11)	With Exclusions Low ROE (12)	With Exclusions Mean ROE (13)	With Exclusions High ROE (14)
ALLETE, Inc.	$2.35	$85.61	2.74%	2.83%	5.00%	6.00%	7.20%	6.07%	7.81%	8.89%	10.04%	7.81%	8.89%	10.04%
Ameren Corporation	$1.90	$76.31	2.49%	2.56%	6.50%	4.95%	6.50%	5.98%	7.50%	8.55%	9.07%	7.50%	8.55%	9.07%
American Electric Power Company, Inc.	$2.68	$89.89	2.98%	3.06%	4.00%	6.10%	5.70%	5.27%	7.04%	8.33%	9.17%	7.04%	8.33%	9.17%
DTE Energy Company	$3.78	$129.64	2.92%	2.99%	5.50%	4.45%	6.00%	5.32%	7.43%	8.31%	9.00%	7.43%	8.31%	9.00%
Duke Energy Corporation	$3.71	$88.63	4.19%	4.31%	6.00%	7.23%	4.90%	6.04%	9.19%	10.36%	11.57%	9.19%	10.36%	11.57%
Exelon Corporation	$1.45	$48.15	3.01%	3.12%	10.50%	Negative	3.60%	7.05%	6.67%	10.17%	13.67%		10.17%	13.67%
FirstEnergy Corporation	$1.52	$43.57	3.49%	3.61%	8.00%	Negative	6.00%	7.00%	9.59%	10.61%	11.63%	9.59%	10.61%	11.63%
Evergy, Inc.	$1.90	$60.93	3.12%	3.22%	NMF	6.15%	6.60%	6.38%	9.36%	9.59%	9.82%	9.36%	9.59%	9.82%
OGE Energy Corporation	$1.46	$42.99	3.40%	3.48%	6.50%	3.80%	4.60%	4.97%	7.26%	8.45%	10.01%	7.26%	8.45%	10.01%
Otter Tail Corporation	$1.40	$52.51	2.67%	2.76%	5.00%	9.00%	7.00%	7.00%	7.73%	9.76%	11.79%	7.73%	9.76%	11.79%
PNM Resources, Inc.	$1.16	$50.55	2.29%	2.37%	7.00%	6.25%	5.50%	6.25%	7.86%	8.62%	9.38%	7.86%	8.62%	9.38%
PPL Corporation	$1.65	$30.66	5.38%	5.41%	1.50%	0.59%	NA	1.05%	5.99%	6.45%	6.92%			
Southern Company	$2.48	$55.84	4.44%	4.52%	3.50%	2.18%	4.50%	3.39%	6.67%	7.91%	9.04%		7.91%	9.04%
Xcel Energy Inc.	$1.62	$60.65	2.67%	2.75%	5.50%	5.80%	5.60%	5.63%	8.24%	8.38%	8.55%	8.24%	8.38%	8.55%
Mean			3.27%	3.36%	5.73%	5.21%	5.67%	5.53%	7.74%	8.88%	9.98%	8.09%	9.07%	10.21%
Median										8.58%				

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals 30-day average as of July 31, 2019.
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Source: Value Line
[6] Source: Yahoo! Finance
[7] Source: Zacks
[8] Equals Average ([5], [6], [7])
[9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7])
[12] - [14] Excludes companies with ROEs less than the a 7.00% return.

Source:
Attachment AEB-2DR.

Arizona Public Service Company

Revised Bulkley 90-DAY CONSTANT GROWTH DCF

Company	Annualized Dividend (1)	Stock Price (2)	Dividend Yield (3)	Expected Dividend Yield (4)	Value Line Earnings Growth (5)	Yahoo! Finance Earnings Growth (6)	Zacks Earnings Growth (7)	Average Growth Rate (8)	All Proxy Group Low ROE (9)	All Proxy Group Mean ROE (10)	All Proxy Group High ROE (11)	With Exclusions Low ROE (12)	With Exclusions Mean ROE (13)	With Exclusions High ROE (14)
ALLETE, Inc.	$2.35	$83.27	2.82%	2.91%	5.00%	6.00%	7.20%	6.07%	7.89%	8.97%	10.12%	7.89%	8.97%	10.12%
Ameren Corporation	$1.90	$74.40	2.55%	2.63%	6.50%	4.95%	6.50%	5.98%	7.57%	8.61%	9.14%	7.57%	8.61%	9.14%
American Electric Power Company, Inc.	$2.68	$87.02	3.08%	3.16%	4.00%	6.10%	5.70%	5.27%	7.14%	8.43%	9.27%	7.14%	8.43%	9.27%
DTE Energy Company	$3.78	$126.92	2.98%	3.06%	5.50%	4.45%	6.00%	5.32%	7.49%	8.37%	9.07%	7.49%	8.37%	9.07%
Duke Energy Corporation	$3.71	$88.54	4.19%	4.32%	6.00%	7.23%	4.90%	6.04%	9.19%	10.36%	11.57%	9.19%	10.36%	11.57%
Exelon Corporation	$1.45	$49.11	2.95%	3.06%	10.50%	Negative	3.60%	7.05%	6.61%	10.11%	13.61%		10.11%	13.61%
FirstEnergy Corporation	$1.52	$42.41	3.58%	3.71%	8.00%	Negative	6.00%	7.00%	9.69%	10.71%	11.73%	9.69%	10.71%	11.73%
Evergy, Inc.	$1.90	$59.09	3.22%	3.32%	NMF	6.15%	6.60%	6.38%	9.46%	9.69%	9.92%	9.46%	9.69%	9.92%
OGE Energy Corporation	$1.46	$42.56	3.43%	3.52%	6.50%	3.80%	4.60%	4.97%	7.30%	8.48%	10.04%	7.30%	8.48%	10.04%
Otter Tail Corporation	$1.40	$51.27	2.73%	2.83%	5.00%	9.00%	7.00%	7.00%	7.80%	9.83%	11.85%	7.80%	9.83%	11.85%
PNM Resources, Inc.	$1.16	$48.30	2.40%	2.48%	7.00%	6.25%	5.50%	6.25%	7.97%	8.73%	9.49%	7.97%	8.73%	9.49%
PPL Corporation	$1.65	$30.91	5.34%	5.37%	1.50%	0.59%	NA	1.05%	5.94%	6.41%	6.88%			
Southern Company	$2.48	$54.03	4.59%	4.67%	3.50%	2.18%	4.50%	3.39%	6.82%	8.06%	9.19%		8.06%	9.19%
Xcel Energy Inc.	$1.62	$58.24	2.78%	2.86%	5.50%	5.80%	5.60%	5.63%	8.36%	8.49%	8.66%	8.36%	8.49%	8.66%
Mean			3.33%	3.42%	5.73%	5.21%	5.67%	5.53%	7.80%	8.95%	10.04%	8.17%	9.14%	10.28%
Median										8.67%				

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals 90-day average as of July 31, 2019.
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Source: Value Line
[6] Source: Yahoo! Finance
[7] Source: Zacks
[8] Equals Average ([5], [6], [7])
[9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7])
[12] - [14] Excludes companies with ROEs less than the a 7.00% return.

Source:
Attachment AEB-2DR.

Arizona Public Service Company

Revised Bulkley 180-DAY CONSTANT GROWTH DCF

Company	Annualized Dividend (1)	Stock Price (2)	Dividend Yield (3)	Expected Dividend Yield (4)	Value Line Earnings Growth (5)	Yahoo! Finance Earnings Growth (6)	Zacks Earnings Growth (7)	Average Growth Rate (8)	All Proxy Group Low ROE (9)	All Proxy Group Mean ROE (10)	All Proxy Group High ROE (11)	With Exclusions Low ROE (12)	With Exclusions Mean ROE (13)	With Exclusions High ROE (14)
ALLETE, Inc.	$2.35	$80.91	2.90%	2.99%	5.00%	6.00%	7.20%	6.07%	7.98%	9.06%	10.21%	7.98%	9.06%	10.21%
Ameren Corporation	$1.90	$71.63	2.65%	2.73%	6.50%	4.95%	6.50%	5.98%	7.67%	8.72%	9.24%	7.67%	8.72%	9.24%
American Electric Power Company, Inc.	$2.68	$82.66	3.24%	3.33%	4.00%	6.10%	5.70%	5.27%	7.31%	8.59%	9.44%	7.31%	8.59%	9.44%
DTE Energy Company	$3.78	$122.25	3.09%	3.17%	5.50%	4.45%	6.00%	5.32%	7.61%	8.49%	9.18%	7.61%	8.49%	9.18%
Duke Energy Corporation	$3.71	$88.21	4.21%	4.33%	6.00%	7.23%	4.90%	6.04%	9.21%	10.38%	11.59%	9.21%	10.38%	11.59%
Exelon Corporation	$1.45	$47.99	3.02%	3.13%	10.50%	Negative	3.60%	7.05%	6.68%	10.18%	13.68%		10.18%	13.68%
FirstEnergy Corporation	$1.52	$40.70	3.73%	3.87%	8.00%	Negative	6.00%	7.00%	9.85%	10.87%	11.88%	9.85%	10.87%	11.88%
Evergy, Inc.	$1.90	$58.37	3.26%	3.36%	NMF	6.15%	6.60%	6.38%	9.51%	9.73%	9.96%	9.51%	9.73%	9.96%
OGE Energy Corporation	$1.46	$41.60	3.51%	3.60%	6.50%	3.80%	4.60%	4.97%	7.38%	8.56%	10.12%	7.38%	8.56%	10.12%
Otter Tail Corporation	$1.40	$50.11	2.79%	2.89%	5.00%	9.00%	7.00%	7.00%	7.86%	9.89%	11.92%	7.86%	9.89%	11.92%
PNM Resources, Inc.	$1.16	$45.67	2.54%	2.62%	7.00%	6.25%	5.50%	6.25%	8.11%	8.87%	9.63%	8.11%	8.87%	9.63%
PPL Corporation	$1.65	$30.81	5.36%	5.38%	1.50%	0.59%	NA	1.05%	5.96%	6.43%	6.90%			
Southern Company	$2.48	$50.90	4.87%	4.96%	3.50%	2.18%	4.50%	3.39%	7.11%	8.35%	9.48%	7.11%	8.35%	9.48%
Xcel Energy Inc.	$1.62	$55.30	2.93%	3.01%	5.50%	5.80%	5.60%	5.63%	8.51%	8.65%	8.81%	8.51%	8.65%	8.81%
Mean			3.44%	3.53%	5.73%	5.21%	5.67%	5.53%	7.91%	9.05%	10.15%	8.17%	9.26%	10.40%
Median										8.79%				

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals 180-day average as of July 31. 2019.
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Source: Value Line
[6] Source: Yahoo! Finance
[7] Source: Zacks
[8] Equals Average ([5]. [6]. [7])
[9] Equals [3] x (1 + 0.50 x Minimum ([5]. [6]. [7]) + Minimum ([5]. [6]. [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.50 x Maximum ([5]. [6]. [7]) + Maximum ([5], [6], [7])
[12] - [14] Excludes companies with ROEs less than the a 7.00% return.

Source:
Attachment AEB-2DR.

Arizona Public Service Company

Accuracy of Interest Rate Forecasts
(Long-Term Treasury Bond Yields - Projected Vs. Actual)

Line	Date	Publication Data: Prior Quarter Actual Yield (1)	Publication Data: Projected Yield (2)	Publication Data: Projected Quarter (3)	Actual Yield in Projected Quarter (4)	Projected Yield Higher (Lower) Than Actual Yield* (5)
1	Dec-00	5.8%	5.8%	1Q. 02	5.6%	0.2%
2	Mar-01	5.7%	5.6%	2Q. 02	5.8%	-0.2%
3	Jun-01	5.4%	5.8%	3Q. 02	5.2%	0.6%
4	Sep-01	5.7%	5.9%	4Q. 02	5.1%	0.8%
5	Dec-01	5.5%	5.7%	1Q. 03	5.0%	0.7%
6	Mar-02	5.3%	5.9%	2Q. 03	4.7%	1.2%
7	Jun-02	5.6%	6.2%	3Q. 03	5.2%	1.0%
8	Sep-02	5.8%	5.9%	4Q. 03	5.2%	0.7%
9	Dec-02	5.2%	5.7%	1Q. 04	4.9%	0.8%
10	Mar-03	5.1%	5.7%	2Q. 04	5.4%	0.3%
11	Jun-03	5.0%	5.4%	3Q. 04	5.1%	0.3%
12	Sep-03	4.7%	5.8%	4Q. 04	4.9%	0.9%
13	Dec-03	5.2%	5.9%	1Q. 05	4.8%	1.1%
14	Mar-04	5.2%	5.9%	2Q. 05	4.6%	1.4%
15	Jun-04	4.9%	6.2%	3Q. 05	4.5%	1.7%
16	Sep-04	5.4%	6.0%	4Q. 05	4.8%	1.2%
17	Dec-04	5.1%	5.8%	1Q. 06	4.6%	1.2%
18	Mar-05	4.9%	5.6%	2Q. 06	5.1%	0.5%
19	Jun-05	4.8%	5.5%	3Q. 06	5.0%	0.5%
20	Sep-05	4.6%	5.2%	4Q. 06	4.7%	0.5%
21	Dec-05	4.5%	5.3%	1Q. 07	4.8%	0.5%
22	Mar-06	4.8%	5.1%	2Q. 07	5.0%	0.1%
23	Jun-06	4.6%	5.3%	3Q. 07	4.9%	0.4%
24	Sep-06	5.1%	5.2%	4Q. 07	4.6%	0.6%
25	Dec-06	5.0%	5.0%	1Q. 08	4.4%	0.6%
26	Mar-07	4.7%	5.1%	2Q. 08	4.6%	0.5%
27	Jun-07	4.8%	5.1%	3Q. 08	4.5%	0.7%
28	Sep-07	5.0%	5.2%	4Q. 08	3.7%	1.5%
29	Dec-07	4.9%	4.8%	1Q. 09	3.5%	1.4%
30	Mar-08	4.6%	4.8%	2Q. 09	4.0%	0.8%
31	Jun-08	4.4%	4.9%	3Q. 09	4.3%	0.6%
32	Sep-08	4.6%	5.1%	4Q. 09	4.3%	0.8%
33	Dec-08	4.5%	4.6%	1Q. 10	4.6%	0.0%
34	Mar-09	3.7%	4.1%	2Q. 10	4.4%	-0.3%
35	Jun-09	3.5%	4.6%	3Q. 10	3.9%	0.8%
36	Sep-09	4.0%	5.0%	4Q. 10	4.2%	0.8%
37	Dec-09	4.3%	5.0%	1Q. 11	4.6%	0.4%
38	Mar-10	4.3%	5.2%	2Q. 11	4.3%	0.9%
39	Jun-10	4.6%	5.2%	3Q. 11	3.7%	1.5%
40	Sep-10	4.4%	4.7%	4Q. 11	3.0%	1.7%
41	Dec-10	3.9%	4.6%	1Q. 12	3.1%	1.5%
42	Mar-11	4.2%	5.1%	2Q. 12	2.9%	2.2%
43	Jun-11	4.6%	5.2%	3Q. 12	2.8%	2.5%
44	Sep-11	4.3%	4.2%	4Q. 12	2.9%	1.3%
45	Dec-11	3.7%	3.8%	1Q. 13	3.1%	0.7%
46	Mar-12	3.0%	3.8%	2Q. 13	3.2%	0.7%
47	Jun-12	3.1%	3.7%	3Q. 13	3.7%	0.0%
48	Sep-12	2.9%	3.4%	4Q. 13	3.8%	-0.4%
49	Dec-12	2.8%	3.4%	1Q. 14	3.7%	-0.3%
50	Mar-13	2.9%	3.6%	2Q. 14	3.4%	0.2%
51	Jun-13	3.1%	3.7%	3Q. 14	3.3%	0.4%
52	Sep-13	3.2%	4.2%	4Q. 14	3.0%	1.2%
53	Dec-13	3.7%	4.2%	1Q. 15	2.6%	1.7%
54	Mar-14	3.8%	4.4%	2Q 15	2.9%	1.5%
55	Jun-14	3.7%	4.3%	3Q 15	2.8%	1.5%
56	Sep-14	3.4%	4.3%	4Q 15	3.0%	1.3%
57	Dec-14	3.3%	4.0%	1Q 16	2.7%	1.3%
58	Mar-15	3.0%	3.7%	2Q 16	2.6%	1.1%
59	Jun-15	2.6%	3.7%	3Q 16	2.3%	1.4%
60	Sep-15	2.9%	3.8%	4Q 16	2.8%	1.0%
61	Dec-15	2.8%	3.7%	1Q 17	3.0%	0.7%
62	Mar-16	3.0%	3.5%	2Q 17	2.9%	0.6%
63	Jun-16	2.7%	3.4%	3Q 17	2.8%	0.6%
64	Sep-16	2.6%	3.1%	4Q 17	2.8%	0.3%
65	Dec-16	2.3%	3.4%	1Q 18	3.0%	0.4%
66	Mar-17	2.8%	3.7%	2Q 18	3.1%	0.6%
67	Jun-17	3.0%	3.7%	3Q 18	3.1%	0.6%
68	Sep-17	2.9%	3.6%	4Q 18	3.3%	0.3%
69	Dec-17	2.8%	3.6%	1Q 19	3.0%	0.6%
70	Mar-18	2.8%	3.7%	2Q 19	2.8%	0.9%
71	Jun-18	3.0%	3.8%	3Q 19	2.3%	1.5%
72	Sep-18	3.1%	3.7%	4Q 19	2.3%	1.4%
73	Dec-18	3.1%	3.7%	1Q 20	1.9%	1.8%
74	Jan-19	3.3%	3.6%	2Q 20		
75	Feb-19	3.3%	3.5%	2Q 20		
76	Mar-19	3.3%	3.4%	2Q 20		
77	Apr-19	3.0%	3.2%	3Q 20		
78	May-19	3.0%	3.2%	3Q 20		
79	Jun-19	3.0%	3.1%	3Q 20		
80	Jul-19	2.8%	2.8%	4Q 20		
81	Aug-19	2.8%	2.7%	4Q 20		
82	Sep-19	2.8%	2.6%	4Q 20		
83	Oct-19	2.3%	2.5%	1Q 21		
84	Nov-19	2.3%	2.5%	1Q 21		
85	Dec-19	2.3%	2.5%	1Q 21		
86	Jan-20	2.3%	2.6%	2Q 21		
87	Feb-20	2.3%	2.6%	2Q 21		
88	Mar-20	2.3%	2.5%	2Q 21		
89	Apr-20	1.9%	2.0%	3Q 21		
90	May-20	1.9%	1.8%	3Q 21		
91	Jun-20	1.9%	1.9%	3Q 21		
92	Jul-20	1.4%	1.9%	4Q 21		
93	Aug-20	1.4%	1.9%	4Q 21		
94	Sep-20	1.4%	1.8%	4Q 21		

Source:
Blue Chip Financial Forecasts, Various Dates.
* Col. 2 - Col. 4.

FEDERAL EXECUTIVE AGENCIES' FIFTH SET OF DATA REQUESTS TO ARIZONA PUBLIC SERVICE COMPANY REGARDING THE APPLICATION TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP A JUST AND REASONABLE RATE OF RETURN DOCKET NO. E-01345A-19-0236 AUGUST 13, 2020

FEA 5.3: If Ms. Bulkley's responses to the above requests are in the affirmative, please provide revised estimates of the real risk-free rate shown on pages 2 and 3 of her Attachment AEB-14DR.

Response: The spread between the yield on 30-year Treasury bond (2.86%) and the yield on 30-year U.S. Treasury Inflation Protected Securities (0.98%) was 1.88% based on the 180-day average of each security, as of August 13, 2019.

The difference between the Projected Nominal 30-Year US Treasury Bond of 3.70% and the inflation estimate of 1.88% indicates a revised estimate of 1.82% would be an appropriate estimate of the real risk-free rate on page 2 of Attachment AEB-14DR.

The difference between the Projected Nominal 30-Year US Treasury Bond of 3.50% and the inflation estimate of 1.88% indicates a revised estimate of 1.62% would be an appropriate estimate of the real risk-free rate on page 2 of Attachment AEB-14DR.

Witness: Ann Bulkley

Arizona Public Service Company

Fair Value Rate of Return
Arizona Staff Methodology

Line		Amount ($M)	Weighting	Weighted Amount ($M)
1	Original Cost Rate Base (OCRB)	$ 8,873.0	50.00%	$ 4,436.5
2	Replacement Cost New, Depreciated Rate Base (RCND)	$ 15,747.5	50.00%	7,873.8
3	Fair Value Rate Base (FVRB)			12,310.3
4	Appreciation Above OCRB			$ 3,437.3
5	FVRB / OCRB Multiple			1.39

	Capital	Amount ($M)	Percent	Cost Rate	Weighted Cost Rate
6	Long-Term Debt	$ 4,022.1	32.67%	4.10%	1.34%
7	Common Equity	4,850.9	39.41%	**9.30%**	3.66%
8	Capital Financing OCRB	$ 8,873.0	72.08%		5.00%
9	Appreciation Above OCRB Not Recognized on Utility's Books	3,437.3	27.92%	0.65%	0.18%
10	Total	$ 12,310.3	100.00%		5.18%

[3] Equals [1] + [2]
[4] Equals [3] − OCRB
[5] Company Data
[6] Equals Recommended ROE on OCRB
[7] Capital Financing OCRB + Return on Fair Value Increment

Sources:
Attachment AEB-12DR
Attachment CCW-1DR
Attachment CCW-22DR, pages 2-4

Arizona Public Service Company

Estimates of Fair Value Return Increment

Scenario 1: Real Risk Free Rate- Long-term Projected Estimate

Step 1		
Consumer Price Index (YoY % Change) [1]		
2022-2026	2.10%	
2027-2031	2.20%	
Average	2.15%	
Consumer Price Index (All-Urban) [2]		
2021		2.69
2031		3.39
Compound Annual Growth Rate		2.35%
GDP Chain-type Price Index (2012=1.000) [2]		
2021		1.18
2031		1.49
Compound Annual Growth Rate	2.36%	
Average Inflation Forecast	**2.29%**	
Step 2		
Nominal U.S. Treasury Bond Yield, 30-year [1]		
2022-2026	3.00%	
2027-2031	3.80%	
	3.40%	
Real Risk-Free Rate [3]	**1.09%**	

Notes:

[1] Blue Chip Financial Forecasts, Vol. 38, No. 6, June 1, 2020, at 14.

[2] Energy Information Administration, Annual Energy Outlook 2020, Table 20

[3] Equals (3.40% + 1) / (1 + 2.29%) − 1

Arizona Public Service Company

Estimates of Fair Value Return Increment

Scenario 2: Real Risk Free Rate- Projected Estimate

Nominal U.S. Treasury Bond Yield, 30-year [1]	
Projection period: 2022-2026	3.00%
Projection period: 2027-2031	3.80%
	3.40%
Expected Inflation [2]	
180-day Average 30-Yr US Treasury Yield	1.51%
180-day Average 30-Yr TIPS Yield	-0.03%
Breakeven Inflation	1.55%
Real Risk-Free Rate [3]	**1.85%**

Notes:

[1] Blue Chip Financial Forecasts, Vol. 38, No. 6, June 1, 2020, at 14

[2] https://fred.stlouisfed.org

[3] Equals [1]-[2]

Arizona Public Service Company

Estimates of Fair Value Return Increment

Scenario 3: Real Risk Free Rate-Normalized Risk-Free Rate

Normalized Nominal Risk Free Rate [1]	2.50%
Breakeven Inflation	1.55%
Real Risk-Free Rate [3]	**0.95%**

Notes:

[1] Duff & Phelps U.S. Normalized Risk-Free Rate Lowered from 3.0% to 2.5%. Effective June 30, 2020.

[2] https://fred.stlouisfed.org

[3] Equals [1]-[2]